University of KwaZulu-Natal

ATTITUDE OF HEALTHCARE WORKERS TOWARDS THE USE OF THE VIRTUAL ELECTRONIC MEDICAL RECORD SYSTEM AT ITHEMBALABANTU CLINIC, DURBAN

By

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A dissertation submitted in fulfilment of the requirements for the degree of

Master of Commerce: Information Systems and Technology

College of Law and Management Studies

School of Management, Information Technology and Governance

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Year: 2020

DECLARATION

I, **Bahindwa Kalalizi** declare that

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ACKNOWLEDGEMENTS

Firstly, I would like to thank God through whom all this was made possible.

My absolute gratitude goes to my supervisor Dr. Prabhakar Rontala Subramaniam whose knowledge and guidance has been absolutely remarkable. Thank you for allowing me this opportunity and sharing your extensive knowledge with me.

A special thank you goes to my family whose support and encouragement has kept me going.

I would like to thank Aids Healthcare Foundation for allowing me to use their premises to conduct my interview. I would also like to extend my appreciation to all the employees at Ithembalabantu who participated in the study.

I am also grateful to the staff members in the School of Management, Information Technology and Governance for all their assistance and support.

I also extend my gratitude to all my friends who have supported me and encouraged me.

ABSTRACT

Successful implementation of electronic medical record systems (EMRs) can result in many benefits. This study conceptualized a model to investigate the predictors influencing the use of the Virtual Electronic Medical Record (VEMR) system. The Theory of Reasoned Action was adopted to investigate healthcare workers' attitudes and behaviours toward the use of the VEMR system at Ithembalabantu clinic. The model guided in measuring the attitude of healthcare workers towards the use of the VEMR system at Ithembalabantu clinic, Durban by conducting observation and interview schedules. Thirty (30) responses were obtained from the employees who were exposed to the use of the VEMR system where narrative qualitative technique was used to analyze the results. The individual attitude toward the use of the system, the subjective norms and the intention behaviour were found to be significant predators of the actual usage of the VEMR system. System benefits and user satisfaction were found to hypothetically lead to the continuance intention to use the system. As a result of this study, healthcare facilities will be better placed to understand the insights of healthcare workers regarding the adoption of the VEMR system and how those come to influence their usage behaviours.

KEY WORDS

Electronic Medical Records, eHealth, EMR, VEMR, use, perceived impacts, individual impacts, healthcare impacts, Fishbein and Ajzen, Theory of Reasoned Actions, Behaviour, intention, attitude, job satisfaction.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The use of paper-based record systems in health institutions emerged in the 19th century when healthcare workers adopted personalised lab notebooks to record and store patient medical information (Sortliffe, 1999). This initiative was then converted into a formal defined patient medial record system and later computerized from paper based records toward electronic based information processing to produce an electronic health record (Haux 2016). Most health institutions in South Africa are still using manual paper-based record systems to collect and store their patients' medical information (Chauldhry et al., 2006). Digitalising health systems is a new area where information is regarded as an asset. Using electronic health systems means to obtain information is vital to making sure that the institution meets the heath needs of the population.

Once the information or data is collected, one can then move to the next level to ensure that the information obtained is used in the most productive way possible to make better informed decisions. The use of mobile technology devices to monitor patient health and collect patient real-time health data plays an important role in closing the gap between the community and healthcare service providers and enables accurate tracking of referrals (Massaih, 2008). The South African Department of Health has taken the lead and piloted various electronic health record systems across the country. These were adopted by the Department of Health to improve the turnaround time for required patient interventions and increased data quality for monitoring and evaluation at a hospital level. Many of these have contributed positively on the advancement of healthcare service delivery while others were discontinued after their initial funding due to resistance to change by healthcare professionals. Therefore, it is important to evaluate and assess the factors that are impacting on the success and failure of electronic health systems in South Africa before expending to new target.

The implementation of a successful electronic health system will not only benefit the country but also contribute to the health priority of the National Development Plan that aims to improve health information systems and eHealth systems. South Africa with its initiative of the National Health Insurance (NHI) cannot succeed without implementing a proper digital health tool to manage patients' information. The implementation of an electronic health system is important and even more important when the continued usage of such electronic system is assured (Mugo, 2014).

1.2 Background to the study

This study focuses on employees' attitude and behaviour towards the use of the Virtual Electronic Medical Record (VEMR) system. The study also assesses lessons learned from users' experiences and gives recommendations for similar system implementation in the future, based on the principles of digital development.

Information and Communication Technology has been used among other tools to achieve the objectives of many organisations. The South African National Department of Health is implementing various health information systems to manage patient medical records and improve the efficiency of their services and decision making (Laudon & Laudon, 2009). The KwaZulu-Natal Department of Health has implemented various electronic health systems to collect and store clinical information to improve patients' health outcomes, for example the Meditec, Tier.Net, ePHC to name few.

After the establishment of Ithembalabantu clinic in 2001, the facility first implemented the Computerkit Systems (CKS) that was used mainly at their dispensing pharmacy. The CKS is a supplier of point-of-sale software solutions for drug dispensing. This software was used daily by pharmacists to dispense and manage the stock of their drugs. Though the CKS system worked well at the pharmacy, this system could not be implemented across all departments because of its limitation of not being an integrated clinical system.

Based on the above limitation, the CKS software thus could not be implemented in other departments within the same healthcare facility. As result to this, Ithembalabantu clinic decided in 2012 to implement the Virtual Electronic Medical Record (VEMR) system. The

objectives of implementing the VEMR system at this facility was to have one system that could work and be used in every department from the patient entry point to the patient exit point. This would ensure that people have access to accurate data at the accurate time and in the correct format.

1.3 Problem statement

As noted earlier on, there is consensus regarding the prominence of eHealth systems implementations for efficiency and sustainability of health systems (eHealth Action Plan, 2012). eHealth usage allows substantial improvements in the health sector for both developed and emerging countries.

The implementation of CKS and VEMR systems at Ithembalabantu clinic was primarily addressing a health issue was important in-service delivery. It is unfortunate that till to date, none of these systems have sustained to a wider facility rollout. Furthermore, the National Health Insurance (NHI) white paper on health information systems stipulates that all healthcare centres should use an electronic system to manage their patients (NHI, 2015). In terms of the above challenges, the study explored the employees' attitude and behaviour towards the use of the VEMR system at Ithembalabantu clinic, in Umlazi, Durban.

VEMR is one of the major initiatives to eHealth systems in South Africa among other adopted initiatives including ICD-10 as the national diagnosis standard and HL7 version 2.4 as the national messaging standard (Council for Medical Scheme 2014). Users' attitude, behaviour and intention to use are mentioned as critical factors in the implementation of EMRs (Huryk, 2010). There is general consensus regarding the functionality of eHealth systems based on healthcare workers' attitude, acceptance and intentions to use (Huryk, 2010).

Despite the high interest and perceived paybacks in the adoption and use of eHealth systems worldwide, its implementation is relatively low especially in the developing world (Busagala and Kawono, 2013). Various studies outline health workers' attitude and consciousness level, deficiency of good management, lack of resource, users' resistance, policy related concerns, poor commitments of staff, poor maintenance services and insufficient healthcare

infrastructures as some of the barriers to eHealth systems use in emerging countries (Kiberu, Mars and Scott 2017; Adebsin et al., 2013).

In this context, this research sought to extent the existing literature to fill in the above-mentioned methodological and contextual gaps. The research is relevant in influencing pertinent strategy and interventions. In line with this, the research answers to the following questions, aims and objectives:

1.4 Research Questions

The study responded to the following questions in order to identify healthcare workers' attitudes and behaviours towards the use of the VEMR system at Ithembalabantu clinic:

1. What is the individual employee's attitude towards the use of VEMR system at Ithembalabantu clinic?
2. How does the employees' intention to use the VEMR system influence the adoption of the VEMR at Ithembalabantu clinic?
3. How does the employees' VEMR system usage behaviour influence the adoption of the VEMR at Ithembalabantu clinic?
4. Why do Ithembalabantu employees use the VEMR system?

1.5 Aims and objectives of the study

This study reviewed the VEMR system implementation outcomes by identifying the literature and documenting evidence supporting the use of ICT to strengthen health care services in South Africa and beyond. Secondly, the study conducted and managed the exploratory mission and needs assessment for a pilot model and contextualised the recommendations from the need assessment to Ithembalabantu clinic. Finally, the study conducted an objective formative assessment of an eHealth adoption; identifying strategic and capacity-building priorities.

Therefore, the objectives of this research are to:

1. To explore employees' individual attitude towards the use of the VEMR system at Ithembalabantu clinic in Umlazi, Durban.
2. To explore how the employees' intention to use the VEMR system influences the adoption of the VEMR system at Ithembalabantu clinic in Umlazi, Durban.
3. To understand how the employees' VEMR system usage behaviour influences the adoption of the VEMR at Ithembalabantu clinic in Umlazi, Durban.
4. To understand what informs the use of the VEMR system at Ithembalabantu clinic in Umlazi, Durban.

1.6 Research rationale

Studies on health information systems in South Africa document substantially the introduction, adoption and implementation of eHealth systems as part of the health sector's transformation path both at national and provincial level (Cline and Luiz, 2013; Osunyomi & Grobbelaar, 2015; Mamatela, 2014). At national level, studies conducted by (Masilela, Foster, Chetty, 2013; Adenuga, Kekwaletswe, Coleman, 2015) examined the existing systems such as the national electronic Primary Healthcare (ePHC), interoperability issue and the stock visibility system showed that progress is already being made to realize some benefits. A content analysis in the context of South African eHealth in big institutions emphasized out of benefits the importance to consider the eHealth associated challenges faced by health professionals (Botha, Botha, Herselman, 2014; Luthuli, Kalusopa, 2020). The following should be highly regarded include the difficulty of learning and using e-health software, personnel costs, standardization of Health Information Systems, time challenges, data privacy, interoperability, sustainability, data quality, usability and the transition from paper to electronic health records (Botha, Botha, Herselman, 2014; Adenuga, Kekwaletswe, Coleman, 2015).

Despite the increased adoption and implementation of digitalized health systems in South Africa, there are quite limited number of studies that investigated the primary healthcare clinics utilizing electronic health system within narrowed institutions like Ithembalabantu clinic in terms of health provisions (Mars, 2012; Jensen, McKerrow, Wills, 2020). The existing literatures are mostly focused on the management and integration of eHealth tools

using quantitative paradigm that minimized the ability to further investigation into the attitudes, behaviours, norms and intentions of the concerned actors in relation to the use of the VEMR system.

1.7 Significance of the study

This study contributes to the existent literature at empirical, theoretical and policy levels. The study adds a new perspective to the literature on eHealth systems by scrutinising the perceived actual behaviour and attitude of healthcare professionals towards the use of health information systems, particularly the VEMR system. The findings of this study that relates to health workers' attitude and behaviour towards the use of the VEMR system enables policy makers to recognize the factors behind healthcare professionals' dissatisfaction with the VEMR system which adversely affect the system's effective adoption and consistent use which ultimately improves the quality of services rendered by the facility. Additionally, the research outcomes offer detailed information and recommendations that assists in guideline developments for future eHealth systems implementations.

1.8 Structure and organisation of the research report

This study report is structured and organised into five chapters outlined as follows:

Chapter 1 – Introduction

This chapter presents the study. Furthermore, the aims and objectives of the study were stated and finally the importance and influence of the study were stressed.

Chapter 2 – Literature Review

This chapter examines existing literature related to the use of electronic medical record systems as well as further literature relevant to the current study. The connection between prior literature and the current study will be illustrated and the gap in the literature which presents an opportunity for this study will be exposed. The conceptual model will then be presented, and the hypotheses will be derived.

Chapter 3 – Research Methodology

This chapter identifies the methodologies that was used for this study. The data collection strategy that was employed will be discussed in detail. The sample will be described, and the instrument used for data collection will be presented. The rigorous process taken to refine the instrument will then be described. Furthermore, the credibility and ethical considerations of the study will be discussed. The analysis strategy is also presented.

Chapter 4 – Research Findings

This chapter presents the findings of the study. It will report tests for reliability and validity, and results of testing the research model and hypotheses.

Chapter 5 – Discussion of Findings and Summary

This chapter concludes by discussing the study's findings, explaining the meaning of the findings in relation to each of the research hypotheses and the possible implications of the findings. The limitations of the study, suggestions for future study and contributions the study has made to the body of knowledge will be also discussed in this chapter. The chapter also summarizes the study.

1.9 Summary

Electronic health record systems have positive influence that are anticipated to impact on the delivery of healthcare services. This chapter explained the background of the study, the research problem that was explored, revealed the research questions, determined the aims and objectives of conducting this study, provided the importance, contribution, and the structure and organisation of the dissertation. The next chapter will provide a literature review on the use of electronic health systems and establishes the gap and need for this study.

CHAPTER 2

LITERATURE REVIEW

2.1. Introduction

Literature review is defined as a *"comprehensive study and interpretation of literature that addresses a specific topic" (*Aveyard 2010). A literature review can either be conducted as an initial review prior to a larger study to examine what already exists and justify further research, or it can be an initiative on itself that provide a complete survey of what other researchers have published in a specific domain (Aveyard, 2010). This section provides a comprehensive review on the definition of eHealth, the role of eHealth, the use of eHealth systems, the attitude towards the use of eHealth systems, the influence on the adoption of the eHealth systems and the challenges in the adoption of eHealth systems are provided. Literature on the intention to use, usage behaviours and attitudes towards eHealth systems are also reviewed. The research gap is then revealed followed by a review of Fishbein and Ajzen's Theory of Reasoned Action that was employed as the theoretical framework in this study. The essence of the literature review in this study is to critically discuss how this research is related to prior research on eHealth in a bid to show the uniqueness and significance of the research problem as well as to substantiate the suggested approach.

2.2. eHealth conceptualized

This section proffers an overview of the eHealth concept: its definitions, development, the premises on which this development took place, the approaches to eHealth purposes, impacts, roles, uses as well as the factors that influence and hinder its adoption.

2.2.1. Definition of the eHealth

eHealth and the use of technology in health care received much attention within health informatics since 2000. eHealth is a broad and complex concept that seems to lack a common definition. Noteworthy is the existence of many definitions of eHealth, with different terms used to describe this service due to its nature and functions that are expanding rapidly. For instance, in case of the hospital care setting, eHealth entails various systems including

electronic patient management, radiology and laboratory information systems, electronic messaging, telemedicine and tele-consultations systems. For home care setting, eHealth can refer to computer system uses by medical professionals for patient monitoring and management, electronic medical records, and electronic prescribing with the Electronic Health Record acting as an important building block for these systems as it allows the integration and sharing of data among healthcare providers across medical centres (Eng, 2001).

The eHealth concept operates in the convergence of health informatics and public health and is often associated with digital health services for patients (Svensson, 2002). As a way to expand, assist and enhance previous health care activities, the concept embraces information and data sharing among patients, health workers and health information networks (European Commission, 2016).

The eHealth discourse is broad, and it stretches over telemedicine, electronic health records, going paperless, procurement, healthcare score-cards and information systems topics among others (Svensson, 2002). Seemingly, the term is a general catchword that characterises 'internet medicine' and everything that is virtually related to computers and medicine (Deloitte and Touche, 2003). Eysenbach (2001) refers to eHealth as "a concerted effort undertaken by leaders in healthcare and hi-tech industries to fully harness the benefits available through convergence of the internet and health care." Therefore, the "philosophy behind the term eHealth has been to use the internet and the information technology in order to respond to new features offered to health systems like the capability of consumers to interact with their systems online, the improved possibilities for institution-to-institution transmissions of data and finally the new possibilities for peer-to-peer communication of consumers" (Eysenbach, 2001:19).

In a broader sense, eHealth characterises the technical development, a state of mind, a manner of thinking, an approach as well as a promise for networked, global thinking in the improvement of healthcare locally, regionally and globally through information and communication technology use (Pagliari et al., 2005:17). In this context, Eysenbach (2001:19) thus academically defines eHealth as "an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the internet and related technologies".

The term eHealth ties both clinical and non-clinical sectors and it embraces both personal and population health-oriented tools (Eng, 2001). Alvarez (2002) notes the appearance of the term eHealth along with other e-words including e-commerce and e-business so as to highlight the significance of the internet and Information and Communication Technologies (ICT) to health care. Mugo (2014) defines eHealth as a comprehensive range of activities that use digital means in the provision of health-related information, resources and services. Busagala and Kawono (2013) define eHealth as a combination of the healthcare system, and ICT to ensure improved health and healthcare.

Little (2014) defines eHealth as the conjunction of digital technologies with ICT and data analytics comprising of decision-making structures of the customary care value chain. WHO defines eHealth as the use of ICT for health (WHO, 2014). In policy work, EU defines eHealth as the use of ICT tools and services in the enhancement of prevention, diagnosis, treatment, monitoring and management (European Commission, 2010). The eHealth notion therefore covers all health aspects through the use of technology in the provision of new techniques for using and improving healthcare services. The definition of eHealth adopted in this study refers to being internet based and directly involving patients.

2.2.2. Types, roles and benefits of eHealth

Paper based information systems have become inadequate for dealing with the complexities of information management in health care and a need for more efficient computerised systems has become apparent (Chauldhry et al., 2006). The purpose of eHealth is thus essentially to enhance all health care aspects and the communication thereof. Eysenbach (2001) provides ten e-components that describe eHealth comprising enhancing quality, evidence based, efficiency, encouragement, empowerment, education, enabling communication and a standardised information exchange between different health care facilities, extending eHealth beyond the original borders of health, ethics and equity.

To meet the aforementioned specified purposes and anticipated benefits, eHealth services are thus categorised in four main types which include online health information, customized online health information (portals, kiosks), internet support (including training, mailing lists, online communities etc) and telehealth (including tele-consultation, mailing lists and remote monitoring and reporting) (Hardiker and Granta, 2011). Andressen (2007) identified the major trends of eHealth services as online and remote access to health information, decision support and provision for lifestyle changes, open public sites (including mental health and

social support), self-help groups, online question-answer services, provider-to-provider and provider-to-client communication services, e-therapy, web-based discussion forums as well as electronic mailing lists.

Researchers, entrepreneurs and counsels also provided a detailed presentation of eHealth sorts at the World of Health IT (WoHit) and Vitalis (Kalam, 2011). Major focus was on varied administrative information systems including medical record systems, flowcharts for healthcare professionals and applications for improved contact with patients such as telemedicine (Kalam, 2011).

The adoption of eHealth systems can play a pivotal role in reducing patients' waiting time to access healthcare services and in decreasing clinical errors. Chismar and Wiley-Patton (2003) consider an eHealth system to be a strategic tool for healthcare organisations to adopt so as to overcome healthcare challenges including medical errors, infrastructural challenges and information asymmetry. Massaih (2008) also noted that electronic health systems can increase access to healthcare services and enhance the quality of care. The use of electronic health systems also improves patient care and establishes big practice-based data sets which are significant in the generation of clinical information in both structured and unstructured formats for observational studies (Wilke et al., 2011).

Effective eHealth use minimizes medical errors, promotes healthcare quality, reduces healthcare expenses and empowers patients to take care of their own health needs (Catwell and Sheikh, 2009). eHealth can also be used to enable awareness campaigns on health-related issues and to support healthcare initiatives. eHealth use also enables a virtual interaction process between patients and healthcare providers, enabled by mobile and web technologies for internet bookings, remote monitoring devices able to measure physiological constraints and real-time patient consultations (Crock, 2016).

According to the European Commission (2016), eHealth makes the health sector more efficient thus it benefits the entire community through an improved access to care. Koch (2012) describes eHealth as an effective way of increasing patient centeredness through the shift of power and responsibility from healthcare workers to patients and the change of patients' role from passive to active participants in their own care. eHealth improves healthcare quality and efficiency; increases access to healthcare information and fosters collaboration within and between organisations (WHO, 2005). Additional benefits of the

eHealth system include streamlined healthcare processes, as well as increased safety and effectiveness (WHO, 2005).

Botha (2015) summarizes the major benefits of eHealth as cost savings, financial benefits, health safety improvements, improved healthcare efficiency, improved decision making, reduced medical errors, access to healthcare professionals remotely, information sharing, medical source and research, workflow efficiency, employee and patient satisfaction, reduced paperwork, quality assurance, standardization of health care, management improvements and improved communication. Additionally, Jones, Heaton, Rudin and Schneider (2012) note improvements in queue management, cost savings as well as the elimination of the aforementioned healthcare bottlenecks. Joos et al's (2006) study also confirms that the eHealth system decreases the time spend to develop a synopsis of the patient, improves communication efficiency and healthcare quality, decreases the time spend on paperwork and increases patient satisfaction. However, despite the indicated notable paybacks of the eHealth system, its adoption and acceptance remains low in both developed and developing countries (Turan and Palvia, 2014). In close relation to this, the following section of the study discusses the determinants and challenges in the adoption of eHealth systems.

2.2.3. Determinants and challenges in the adoption of eHealth systems

eHealth implementation is a strategic tool for ensuring an efficient exchange and sharing of healthcare information systems among healthcare institutions for the continuity of care (Adebsin et al., 2013). The adoption of eHealth in healthcare is based on five main factors including performance expectancy, social influence, facilitating conditions, effort expectancy and threat appraisals (Ganesh, 2004). eHealth adoption is also motivated to an enormous extent by consumer preferences, health system policy, technical capabilities and economic considerations (Ganesh 2004). Equally, the desires to distinguish one's products from others as well as to speed and improve service provision also facilitate eHealth implementation (Li et al., 2013).

Govindaraju et al (2013) note ability, motivation and opportunities as the factors that influence the adoption of eHealth systems. They note that any information processing by a person depends on his motivation, opportunity and ability. In this case, motivation influences the behaviour of the person to adopt or reject a particular system. Additionally, Gagnoet (2014) argues that beliefs and moral norms could encourage or discourage the adoption of any eHealth recording system. In this vein, Seeman and Gibson (2009) confirm both attitude

towards eHealth systems and perceived behavioural control as the most important predictors of health care workers' intention to implement eHealth systems.

Based on these determinants, there are considerable challenges that hinder the rollout of eHealth particularly in emerging countries, South Africa included. Adebsin et al (2013) outline the deficiency of understanding the implication of eHealth, the nonexistence of initial ICT infrastructures, restricted participation in eHealth standards development and shortage of human resource capacity for eHealth standard as the major barriers to eHealth adoption.

WHO (2012) notes the major barriers to be little budget for information communication technology, lack of infrastructure for the maintenance of healthcare services, unreliable electricity supply, shortage of human capacity and the failure of electronic information systems to interoperate in order to share information regarding eHealth standards among the healthcare sector. Busagala and Kawono (2013) also note the growing cost of ICT infrastructures, absence of technical skills and resistance to change by healthcare workers as the major challenges to the adoption of eHealth systems.

The barriers to the successful adoption of eHealth systems are summarized as financial barriers to purchase the required hardware and the high initial costs of adoption, the uncertainty of financial returns, time costs, attitudes and perceptions of users and the lack of information technology and clinical resources. Struggle of learning and using the system, personnel costs, standardization of all health information systems, the time consuming process of updating the electronic health records thoroughly, interoperability, sustainability, data quality as well as infrastructure and appropriate software shortages are also bottlenecks to eHealth adoption (Botha, 2015).

In reference to Africa in particular, Kiberu, Mars and Scott (2017) note the extreme burden of disease, the lack of healthcare professionals, rapidly rising populations that outstrip the production of healthcare workers, unreliable power provisions, high telecommunication costs, absence of government will and civil unrests that frequently damage infrastructures as the major challenges to eHealth implementation. On the other hand, Boonstra and Broekhuis (2010) identified some challenges to the adoption of electronic medical record ranged from technical, organisational, social, financial, time, legal, psychological and change process. They mentioned that, all these categories are interrelated with each other.

2.3. eHealth Use in South Africa

There are no universal approaches to eHealth systems implementation since the state of eHealth differs worldwide. The use of eHealth systems in the United States varies by states, varies from 89% in Massachusetts to 54% in New Jersey (National Centre for Health Systems, 2015). In countries like Sweden, Netherlands and Australia, eHealth systems usage ranges from 90%, 62% and 55% respectively (Mugo, 2014). However, in developing countries, the implementation of eHealth systems is significantly lower (Mugo, 2014).

Just like in any other country, it has been broadly recognized that Information and ICT is an important tool to ensure an acceptable and consistent health information system that enables the production of relevant and accurate information for decision making (eHealth Strategies for South Africa, 2012). A number of policies including the White Paper on Health Care Reform (1997); Medical Schemes Act (Act 131 of 1998); Public Service Act (2001); National Health Act (Act 61 of 2003); Health Sector Strategies Framework (1999-2004); and the National Health Amendment Act (Act 12 of 2013) support the adoption and use of ICT in healthcare service delivery in South Africa. The South African eHealth Plan emphasises the use of ICT for efficient healthcare service delivery in the treatment of patients, research, and training of medical students, in tracking diseases as well as in the monitoring of public health (Masilela, Foster and Chetty, 2014).

The National eHealth Strategy in South Africa (2012) outlines ten strategic priorities for the effective eHealth implementation. These strategies include strategy and leadership, stakeholder engagement, standards and interoperability, governance and regulation, monitoring and evaluation, investment, affordability and sustainability, benefits realisation, capacity and workforce, eHealth foundations as well as systems and tools to support healthcare service delivery (eHealth Strategies Plan, 2012).

The history of eHealth use in the South African healthcare system can be drawn from the establishment of the District Health Information System (DHIS) that was nationally launched in 1998 and was facilitated by the Health Information Systems Programme (HISP) which included training on ICT, data management, software tools and design for healthcare service delivery (Info Dev, 2006). Another initiative is the introduction of the computerized National Healthcare Management Information System in 1994 (Info Dev, 2006).

Regarding the notable use and promotion of eHealth use, South Africa is an affiliate of the National Information Standards Technical Committee (ISO/TC 46) (The Information, 2015). The country also made notable efforts in the promotion of the interoperability and interchange of data. For instance, South Africa adopted the use of ICD-10 as the national diagnosis standard and HL7 version 2.4 as the national messaging standard (Council for Medical Scheme 2014). Additional adopted initiatives include the telemedicine initiatives undertaken by the Medical Research Council, Health's Love Life Project and the establishment of the Closed Health Broadcast Channel (eHealth Strategies Plan, 2012).

The South African government also adopted the Virtual Electronic Medical Record (VEMR) which is an electronic patient management system to run in hospitals, primary healthcare clinics and community based programmes. Developed in South Africa by VP Health Systems, the VEMR was designed with the intention to provide all healthcare workers and clinicians with a practical and easy to use solution to monitor disease and condition progress, thereby allowing effective exchange of detailed clinical information amongst health workers, ensuring stability of care for patients as well as effective patients' data management. The system has built in checks to ensure integrity of data. It is far superior to a paper-based system in that it allows for much faster processing times, data retrieval and decision making.

Just like any other eHealth system used in healthcare delivery in South Africa, the VEMR's major purpose is to advance the health status of people through an improved efficiency and coordination of services, increased number of patients processed and an improved easy referral of patients to other services (Department of Health, 2013). Additional anticipated benefits of eHealth implementation in South Africa include an operational and standard management of healthcare facilities, access to information warehouses, systems and literature, education for public and access to formal training for health service and overcoming distance in the diagnosis and treatment of patients (eHealth Strategies, 2012).

However, despite these promising benefits, just like in any other African country, eHealth implementation and efficiency is still minimal in South Africa. Progress has been so low especially with investment, benefits realisation, sustainability and affordability, capacity and workforce, eHealth foundations as well as systems and tools to support healthcare service delivery (Masilela, Foster and Chetty 2014). Major challenges for eHealth implementation in South Africa include poor ICT skills, inadequate funding of ICT in healthcare, the lack of

standardization and integration between health information systems, geographic distribution and insufficient ICT infrastructure (Masilela, Foster and Chetty, 2014).

2.4. Healthcare professionals' attitude and usage behaviour towards the use of eHealth systems.

The attitude of healthcare workers towards the use of electronic health systems has a major influence in the adoption process of any eHealth system (Huryk, 2010). However, minimal research has been conducted on healthcare workers' attitudes and behaviour towards the use of eHealth systems. Few researches to be discussed in this section were conducted in clinics, hospitals and community health centres globally on the adoption and use of eHealth systems, the barriers to eHealth systems adoption and how individual intention to use eHealth systems influences their implementation.

Young and Jinhyung (2014) conducted a survey to assess the factors influencing the use of an Electronic Medical Record (EMR) system in small hospital in Korea. Their results revealed that numerous managerial structures of hospitals, information technology infrastructure and environmental factors were correlated to the adoption of eHealth systems in many small hospitals in Korea.

Seok Kim et al., (2016) also conducted a quantitative research to investigate the dynamics that influence users' intentions to utilise mobile health systems at a university clinic. Their study findings revealed that the end-users' intentions to use the eHealth system were specifically subjected by their expectancy and individual attitudes. Closely related to this, Lehmann, Connor, Shorte and Johnson (2015) argued that perceptions in health care workers with previous experience in electronic medical record systems were more positive than workers without any previous experience. Their study concluded that healthcare workers' positive attitude towards an eHealth system use depended on previous experience in the electronic medical system. Newly graduated medical staff positively embraced an eHealth system as compared to the experienced staff that was very slow to embrace the system. The attitudes of healthcare workers thus substantially influence the adoption and effectiveness of eHealth.

Kortteisto et al., (2010) also conducted a cross-sectional online based survey in Finnish healthcare organisations with healthcare professionals to assess the relationship between the

attitudes towards behaviour, the subjective norm, perceived control behaviour and the healthcare workers' intention to use clinical practice guidelines in their decisions on patient care and management. Their findings revealed that the attitude towards the behaviour, the subjective norm and the perceived behaviour control were imperative causes associated with the professionals' intention to use clinical practice guidelines. Perceived behaviour control was outlined as the strongest factor for physicians while the subjective norm was identified as the key factor for the nurses and other professionals. Based on their study findings, it can be argued that context and guideline based factors as well as normative perceptions allied to social pressures either enable or obstruct the intention to use clinical guidelines among healthcare workers.

Furthermore, Yehualashet, Andualem and Tilahun (2015) also conducted a cross-sectional quantitative study to assess the attitude, use and obstructing factors of healthcare professionals' use of Electronic Medical Records (EMR) in a referral hospital in Ethiopia. They found out that most students were using the EMR system daily to perform their work and that more than half of the students had positive attitudes towards EMR. Technical (knowledge, computer literacy), organisational (management support, infrastructure, training access, computer access, regular meeting,) and personal (age, working experience) variables were identified as substantial factors in the development of positive attitude towards high use of the system.

Last but not least, Tilahun and Fritz (2015) also conducted a quantitative cross-sectional study to evaluate the usage pattern, level of user satisfaction and factors of health professionals' satisfaction towards a broad EMR system implemented in Ethiopia. They found out that healthcare professionals' use of the EMR system was low and that they were mostly unhappy with the service of the implemented electronic system. The dissatisfaction was mainly caused by poor service quality, the current practice of parallel systems (EMR and paper based) and fractional departmental use of the system in hospitals.

The aforementioned studies are crucial in giving a general understanding of the relationship between health professionals' attitude, subjective norms and the eHealth system usage behaviours. However, the differing findings of contrary studies in this arena suggests that efforts to generalize the effects of these variables on the implementation of eHealth systems are certain of distorting policy opportunities hence this study that specifically targets Ithembalabantu clinic in Durban, South Africa is justified. Moreover, previous researches

mostly measured data using regression analysis, univariate and multi-variate regression models (Tilahun and Fritz, 2015; Kortteisto et al., 2010). Quantifying data threats the loss of data during the analysis process. This study thus adds to the body of literature by qualitatively exploring the attitude and behaviour of healthcare workers towards the use of the VEMR system. Concerned actors were given opportunities to speak their lived realities from their own perspectives.

2.5. Research gap

The above sections conceptualised eHealth. Its definitions, evolutions, use, determinants, purposes and effects were discussed. eHealth uses from a global to the South African level were also discussed together with the healthcare professionals' attitude and usage behaviours towards the implementation of eHealth systems. Gaps within the existing scholarly work have been identified through this literature review. Despite eHealth being a topical issue that spawned local and universal debates, limited studies have been keen to explicitly examine healthcare workers' attitude and behaviour towards the use of eHealth systems, particularly the VEMR system. Little is known regarding individual employees' attitudes towards the use of the VEMR system, how employees' intention to use the system influences the adoption of the VEMR systems, how employees' VEMR system usage behaviour influences the adoption of the VEMR systems by healthcare workers. For the studies that considered the influence of the above-mentioned variables (Lehmann, Connor, Shorte and Johnson 2015; Tilahun and Fritz 2015; Kortteisto et al., 2010), they examined these outside Durban hence the essence of this research that captures the daily realities in Durban, South Africa. Additionally, previous studies were entrenched in the quantitative approach and thus failed to proffer an in-depth and strong descriptive analysis of healthcare workers' attitude, behaviours and the eHealth system use discourses from the concerned end-users' perspective.

This study therefore pursued to address these knowledge and methodological gaps from the perspective of healthcare professionals through an exploration of healthcare workers' individual attitudes towards the use of the VEMR system at Ithembalabantu clinic in Umlazi, explore how the employees' intention to use the VEMR system influences the adoption of VEMR system at Ithembalabantu clinic in Umlazi, understand what informs the use of the VEMR system at Ithembalabantu clinic in Umlazi, and finally understand how the

employees' VEMR system usage behaviour influences the adoption of the VEMR at Ithembalabantu clinic in Umlazi, Durban. In the following section I discuss the Theory of Reasoned Action which forms the basis of this study and the core around which my inquiry was interwoven.

2.6. Theoretical Underpinnings of the Research Model

The previous sections in this chapter explored the literature review around the adoption of eHealth systems. This section aids to build up the theoretical foundation of this study. The Theory of Action (TRA) advanced by Fishbein and Ajzen (1975) form the basis of this study and the core around which this inquiry was interwoven. Informed by literature review, research findings and other models of behavioural prediction, the study edified and modified the TRA to explore healthcare workers' attitude and behaviour towards the use of the VEMR system at Ithembalabantu clinic in Durban. While Fishbein and Ajzen's (1975) theorisations have met substantive criticism on a number of grounds, their thinking tools still have significance in broader applications to this study. To establish an understanding of the operation of the TRA in this study, I offer a discussion of the main elements of this theory and articulate how these components are salient to this study.

There exist several literatures related to frameworks that explore aspects influencing the adoption and users' behaviour of information technology innovation. The Technology Acceptance Model (TAM) (Davis 1989), the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al. 2003) and the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) are the most used theories predicting usage behaviour. This study specifically focuses on the psychological individual attitude and behaviour toward the use of the VEMR system rather than the VEMR system quality and its actual impact. Ajibade (2018) documents several weaknesses of TAM in explaining users' behaviour. The model insufficiently predicts ICT acceptance and users' adoption and technology usage especially in e-government context. The TAM also insufficiently explains users' rejection or acceptance behaviour of technology use and incomprehensively provides the social influence and conditions that facilitate users' behaviour (Ajibade 2018). On the other hand, the UTUAT does not assess the actual ICT usage, uses a single IS for research and offers little reflection on cultural differences (Lee etal, 2003). As explained further later on, the Theory of

Reasoned Action (TRA) was therefore found to be of more significance in this study when interviewing healthcare workers at Ithembalabantu clinic as it predicts the behavioural intent caused by each individual attitude and subjective norms toward the use of the VEMR system. This theory is displayed below in Figure 2.1.

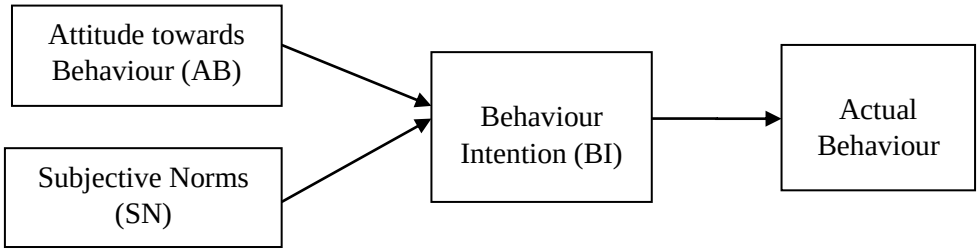

Figure2.1: Fishbein and Ajzen's Theory of Reasoned Action (1975)

The Theory of Reasoned Action (TRA) can be summarized as follows:

2.6.1. The conceptual aspect of the Theory of Reasoned Action

According to Fishbein and Ajzen (1975), the main factors of this theory are "behavioural intention (BI), Attitude toward Behaviour (AB) and Subjective Norm (SN). Based on this model, a person's beliefs lead to their attitude toward behaviour (AB) which in turn leads to behavioural intention to perform a certain behaviour (BI)" (p.211). Attitude towards behaviour is the opinion of the person about the behaviour that is expected of them. Those opinions could be positive or negative. The subjective norms (SN) are defined as the influence that others will have on said behaviour, which also leads to behavioural intention (BI). This could be represented in a simple equation format as: BI= AB + SN (Fishbein & Ajzen, 1975).

2.6.2. The contextual aspect of Fishbein and Ajzen's model

The contextual aspect of the TRA is based on the relationship between human behaviour and attitude and it is mostly used to assess how people react based on their previous attitudes and behaviour. What is significant about the TRA is that it gives the person room to balance his/her decision towards a certain behaviour, not only by allowing personal opinion to influence his/her attitude, but also in terms of what others have said about the behaviour, which to some extent could influence the person against executing the behaviour.

The TRA was developed and is centered on expectations that human beings are rational and that they make efficient use of the information provided to them. Fishbein and Ajzen (1975) emphasise people's considerations of the implications of their actions prior to their decisions to perform or not to perform certain behaviours. In the same vein, this study assumes the VEMR system users' selection decision to be a rational process, hence the choice of the TRA in this study over other models of behavioural prediction.

Furthermore, the TRA explains the nexus between attitude and behaviour within human action (Fishbein and Ajzen, 1975). As aforementioned, this approach includes subjective norms and personal feelings of the moral obligation to undertake a behaviour. This theory thus provides a framework for approaching the complex behavioural domain under the VEMR system. The TRA is mainly concerned with the determinants of behavioural intentions rather than attitude as the main predictors of actual behaviours (Fishbein and Ajzen, 1975). In their recent publication, Fishbein and Ajzen (2010) further develop the conceptualization of the theory of planed behaviour' predictors of intentions. This is a well-known and frequently applied framework for explaining and predicting human behaviour. It focuses on the controlled aspects of decision-making and on behaviours that are goal-directed and steered by conscious self-regulatory processes. For this reason, Ami-Narh and Williams (2012) used this approach of reasoned action to revised UTAUT model that aimed to investigate eHealth acceptance of health professionals in Africa. The significance of this theory is not limited to health research but also to other aspects of humankinds. Sok, Borges, Schmidt and Ajzen (2020) employed the same theory to understand farmer decision making and prediction over adoption and acceptancy of new technologies that seek to promote sustainability and resilience while ensuring efficient business management to produce food.

The specific purposes of the TRA adopted in this study are to predict and understand motivational influences on actual behaviours that are not under individuals' volitional control as well as to explain virtual human behaviour (the acceptance of the VEMR system).

Just like the TRA, this study assumes that Ithembalabantu healthcare professionals' performances of specific behaviours is determined by their behavioural intentions and attitudes towards the system's use. Noteworthy, this study did not consider the TRA as an "end in itself" or a "doctrine of truth", instead the theory was taken as a starting point and

was used and applied in empirical practice, motivated by the desire to edify and modify it based on research findings, related literature and other models of behavioural prediction.

2.7. Summary

To position this study in its academic context, this chapter reviewed existing literature on the adoption and use of eHealth systems associated to the present study so as to provide an understanding into the research field. The chapter conceptualised and provided an overview of eHealth from global to the local perspectives. Specifically, a comprehensive review on the definition of eHealth, the role of eHealth, the use of eHealth systems, the attitude towards the use of eHealth systems, the influence on the adoption of the eHealth systems and the challenges in the adoption of eHealth systems were provided. Literature on the intention to use, usage behaviours and attitudes towards eHealth systems was also reviewed. The research gap was then revealed and a model synthesised from the Fishbein and Ajzen's Theory of Reasoned Action was proposed, illustrated and justified. To cover the aforementioned outlined research gap, this study intends to explore employees' individual attitude toward the use of the VEMR system at Ithembalabantu clinic in Umlazi, understand what informs the use of the VEMR system at Ithembalabantu clinic in Umlazi and finally understand how the employees' VEMR system usage behaviour influences the adoption of the VEMR at Ithembalabantu clinic in Umlazi, Durban. The following chapter (Chapter 3) will discuss the adopted research methodology.

CHAPTER 3

RESEARCH METHODOLOGY

3.1. Introduction

To compose this study and make it intelligible, this chapter provides a detailed account of the research methodological aspect and design that was adopted in this study. It discusses the suitability and pertinence of the methodological, design, ethical and applied practices that were adopted. The logical practicalities and comprehensive considerations which inspired the choice of these positions are emphasised in relation to the outlined research aim and objectives. Notably, the choice of the specific approaches and techniques from complex, and multiple methodologies and research practices (Punch 1998) was informed by the researcher's competence, style and taste in relation to the aforementioned research aim and objectives in this study.

3.2. Research Paradigm: The Interpretivist Approach

A research paradigm entails the shared beliefs and agreements that form the foundations through which problems are understood and solved (Creswell 2003). It implies the pattern, structure, framework, ideas, values and assumptions that set the basis of a research that are considered as epistemology, methodology and ontology (TerreBlanche and Durrheim 1999). Research paradigms are classified into three logically distinctive classifications which are positivism, interpretivism and critical post-modernism (TerreBlanche and Durrheim 1999). Positivism focuses on scientific methods and quantitative data hence positivist methods lack depth and validity as data is summarized collectively and statistically (TerreBlanche and Durrheim 1999). Critical post-modernism combines critical theory and post-modernism and it seeks to deconstruct power and domination to ensure participation of the previously dominated and excluded (Gephart 1999). This approach is criticized for lacking coherence and its hostility to 'truths' (Gephart 1999). This study is entrenched on an interpretivist paradigm, the constructivist epistemological and ontological discourse to be particular that is analysed through qualitative methods and has its philosophical base on the hermeneutics and phenomenology philosophies (Gephart 1999).

In correspondence with the tenets of theory of reasoned action adopted in this study, the interpretivist approach explores causation, acknowledges the differentiated nature of the social field and recognises the subjectivism of individuals and the meanings attached to their activities as key to the understanding of social phenomena (Deetz 1996). The interpretivist approach also acknowledges multiple realities and views them as socially constructed and consisting of people's subjective experiences of their social world (Willis 1995). This approach thus provides a solid epistemological basis for this philosophical inquiry that seeks to theoretically, methodologically and empirically contribute to the health systems discourse.

3.3. Research Approach: Qualitative Methodology

Research approach is a strategy and procedure undertaken in the collection, analysis and interpretation of data (Creswell, 2013). Bryman (2012) notes the three mostly accepted types of research strategies which are quantitative, qualitative and mixed methods. These methodologies carry critical difference in terms of the role of theory, epistemology and ontological concerns (Bryman, 2012). Quantitative methodology originated from the natural sciences to explore natural phenomena while qualitative was established from the social sciences to study social and cultural phenomena (Bryman, 2012). The use of these approaches is grounded on the context, purpose and nature of the study in question. These can also be mixed based on the nature of the study and its methodological orientations and foundations (Bryman and Burgess 1999:45). Based on the population and sample size that was taken, this study adopted the qualitative approach as it gives the opportunity to ask open questions to obtain enough information and participants are freely deemed to release as much information they could possess with regards to the use of the VEMR system to capture and understand healthcare workers' attitudes and behaviour towards the use of the VEMR system at Ithembalabantu clinic. Silver and Lewins (2014) argued that qualitative research focuses on an individual's life experience. This also justify the restricted number limited to 30 participants in this study.

3.3.1. Rationale for a Qualitative Study

The qualitative approach to research aims at exploring each detail about a matter or a case. It carries out the quality of whatsoever is being researched (Nieuwenhuis, 2007). Qualitative research captures "abstract concepts; emotions, social organisation, social relationships…"

which are life experiences and social processes difficult to quantify (Ulmer and Wilson 2003:523). Gonzales, Brown and Slate (2008, p. 3) argue that qualitative research offers complex details and different understanding of significance and observable as well as non-observable circumstances, phenomena, attitudes, intensions and behaviours. They add that, this approach aids to give voice to the participants who in this case are the employees at Ithembalabantu clinic who are exposed to the use of the VEMR system.

Creswell (2013) mentions quite a few benefits of qualitative research. Firstly, it uses accurate procedures and numerous data collection techniques. Secondly, enquiry is a key feature, and it can accommodate one or more forms such as case study, ethnography, grounded theory, phenomenology or biography. Thirdly, the research starts with a single focus on a problem, not a hypothesis or the interaction of relationships in variables. Fourthly, the measuring rod for verification or validity is set out and rigour is practiced when writing up the report. Fifthly, credibility is required in order to allow the readers to become part of the situation or problem. Sixthly, data is analysed in various categories and these categories are multi-layered. Lastly, the research involves the reader and it is full of unforeseen insights, while maintaining validity and trustworthiness. A qualitative approach is useful in healthcare as it helps to better understand the phenomena that are being investigated. It also assists in improving the practices with the aim of advancing health outcomes and assists other facilities through the same situations (Waltz, *et al*., 2010:225).

Waltz et al (2010:226) and Moule and Goodman (2014:207) also note some valued characteristics of qualitative research. First, qualitative approach is conducted in a natural setting to allow the researcher to see the whole picture; second, the purpose of using qualitative approach is to understand the respondents' world, and not to display the outcomes; third, qualitative approach is usually inductive reasoning, information or data is first collected then transformed to generate a meaning, and finally, the qualitative approach focuses on the respondents' experiences, views and perceptions.

The qualitative approach can also be used for various reasons even when there is little knowledge about the phenomenon (published or unpublished). It was for these inherent attributes that this study adopted a qualitative approach to explore the employees' attitude and behaviour towards the use of the VEMR system at Ithembalabantu clinic in Umlazi, Durban. Particularly, the research employed a case study research design to collect the much-needed data for this study. The qualitative research design awarded the researcher flexibility

to follow unpredicted ideas throughout the study as well as to be sensitive to contextual factors, which influence participants' perceptions, practices, knowledge, skills and conditions. The social, economic and political complexities imbedded in the use of VEMR system were best understood using qualitative methodologies.

3.4. Research Design: The Case Study Strategy

A research design depicts the overall logic or action plan of a study from the philosophical expectations, research approach to the collection of data that clarifies how the research is to be conducted in overall (Yin, 1994). A research design serves to "plan, structure and execute" the research for the maximisation of the "validity of research findings" (Yin, 2003:19). This study adopts a case study approach to research. A case study is ''an in-depth study of one specific case in which the event may be a person, a group of people, a community, an organisation, a school, a movement, an event, or geographical unit''(Neumann 2006, p. 40).

Cohen, Manion and Morrison (2011) describe three major categories of case study, which are the explanatory, the descriptive and the exploratory. The explanatory case study emphases on testing theories or ideas that have been generated, while the descriptive case study emphases on providing comprehensive narrative information about a case or example. The exploratory case study on the other hand probes into a distinguished phenomenon and offers a stage for the researcher to get comprehensive information about the phenomenon. This study adopts an exploratory case study using a single case design so as to offer the researcher with a comprehensive investigation of the Ithembalabantu clinic employees' experiences with the use of the VEMR system as an eHealth system.

In case studies, phenomena are examined in detail for longer periods through the use of several sources of data (McMillan and Schumacher, 2001). Given the interpretive foundations of this study and the nature of the research questions, the case study method is deliberated to be the most suitable approach to adopt for this study, owing to the systematic way of in-depth data collection and analysis it provides particularly when the boundaries between context and phenomena are blurry (Ritchie, 2003). The case study methodology is conceived suitable for this study as it permits one to understand complex factors that are operational within a unit. Considering that the health system is defined by interplay of social, cultural, economic and political factors in a specific context, the case study methodology generates in-depth insights into these facets. Its unique characteristic of comprehensive and

intensive examination of issues produces a richer and authentic interpretation of the issues under investigation.

Case studies allow for the utilisation of various qualitative techniques including participant observation, semi-structured interviews, as well as data collection of an organisation's minutes and reports. They allow the author to highlight the complexity and particular nature of the case (Baxter & Jack, 2008). Case studies present a real-life practice and offer a broad explanation of an example or a fact and an understanding that would present the reader with noticeable know-hows of the participants (Denzin & Lincoln, 2003).

The case study method is also flexible, and it allows for the exploration of unexpected paths of discovery (Merriam 1998). Also, the use of multiple data collection methods provided in case studies produces strong explanations of problem under study and ultimately provides the researcher access to the 'subtleties' of ever shifting and multiple explanations (Myers, 2009). The adoption of the case study approach in this study was useful in revealing valid data concerning the employees' unique experiences, perceptions and behaviour within their real-life context a situation that is impossible in quantitative or experimental research strategies (Creswell 2003). The use of varied research techniques also increased the researcher's confidence concerning the levels of reliability and validity of research findings that is critical in all studies (Punch, 1998) hence the significance of the case study approach in this study.

However, case studies have been criticised for non-representativeness, lacking statistical generalisations, incapacity to generate themes, potential researcher bias and the absence of a step-by-step examination of case study data (Cornford and Smithson 1996). Despite these criticisms, it is worth to note that case study researches can be generalised because "looking at multiple actors in multiple settings enhances generalisability" (Denzin and Lincoln 2000:193). Case studies are useful for analytical generalisations even though they do not claim to be representative (Silverman 2000). This study does not aim to generate new theories and will not be conducted for statistical generalisations; instead it seeks to make particularistic in-depth descriptions and explorations of healthcare workers' attitudes and behaviours towards the use of the VEMR system and analytically generalise them, hence the case study method is of more significance in this study.

3.5. Research site

Ithembalabantu (People's hope in English) Clinic is a state-of-the art primary healthcare facility based in Umlazi, Durban, established in 2001 to provide HIV/AIDS and TB related care, treatment and support services to the community in eThekwini and surroundings. This study was conducted at this clinic in Umlazi, Durban, to explore the employees' attitude and behaviour towards the use of the VEMR system. Ithembalabantu is a non-government clinic managed by Aids Healthcare Foundation. This clinic was purposively and conveniently selected in this study owing to its accessibility, simplicity and permissiveness. The researcher lived in the study area for a period of two years and therefore he used previously established social networks to access the research site.

3.6. Target population

Fraenkel and Wallen (2003) define a population as, "the group of interest to the researcher, the group to whom the researcher generalized the results of the study" (p.97). They categorize population into two categories, namely: the targeted population referring to the actual population to which the research would be generalised, and the accessible population referring to the population to which the research is generalisable. The preliminary sampling frame in this study consisted of all Ithembalabantu clinic employees who had exposure and interest to the VEMR system. These were the approximately eighty staff members who were employed on a full-time basis at Ithembalabantu clinic who included doctors, nurses, pharmacists, data capturers, admin clerks, the research team and counselors

3.7. Sampling design

The sampling design is a road map or structure that guides the researcher in the fundamentals of selecting the study sample. Sampling is generally used to make interpretation about specific population or an overview in relation to the current model (Taberdoost & Hamed, 2016).The correct use of sampling methods minimizes costs and ensures accurate and efficient researches (Babbie, 2001). In general, there are various sampling techniques which are commonly divided into two categories: probability or random sampling and non-

probability or non-random sampling (Yin, 2003). In probability sampling, every element in the population have the same chance of being selected in a sample for the study (Yin, 2003). On the other hand, in non-probability sampling, the chance of one to be chosen is known which makes this method convenient, less costly and useful in the selection of participants in sensitive studies (Babbie 1990), hence the adoption of this sampling technique in this study.

Non-probability sampling was also adopted due to its emphasis on small samples to explore a real-life phenomenon and because it does not make any statistical interpretation in relation to the broader population. There is also a clear motivation for the inclusion of some participants relatively to others in this method (Babbie, 1990).

3.7.1. Sampling techniques

Purposive sampling was used as the primary focus of the data collection in this study to obtain depth and richness of the data (Struwig & Stead, 2004). In purposive sampling, the participants are selected based on the decision of the researcher with regards to their knowledge and understanding of the subject at hand (Babbie, 1990) The purposive or judgmental sampling strategies allowed the researcher to deliberately select participants who could provide significant information that cannot be obtained from other population choices which minimised costs and time.

To ensure the selection of 'information rich' participants, an inclusion and exclusion criteria was established for clarity on the requirements while using purposive sampling (Allen, 1971). Burns and Grove (2005:343) define the inclusion criteria as a characteristic that a participant should have in order to be selected as part of the research sample. The inclusion criteria of participants in this study aimed to identify employees who were exposed to the use the VEMR system at Ithembalabantu clinic and whose jobs entailed the capturing, processing, analysis, interpretation, presentation and use of data. This study excluded employees from Ithembalabantu who never used the VEMR system.

3.7.2. Sample size

Thirty (30) participants were recruited for this study based on their experience and exposure to the use of the VEMR system. It was expected that this sample size would provide data saturation depending on the participants' knowledge. The choice of the sample size was influenced by a desire to conform to the small enrollment numbers characteristic of qualitative research (Miles and Huberman, 1994).

Table 3.1: Sample size by department

Pharmacy	4
Medical	2
Monitoring and Evaluation	8
Research	3
Patient Administration	6
Laboratory	3
Nursing	3
Psychosocial	1
Total	**30**

Table 3.2: Sample size by profession

Doctors	2
Nurses	5
Pharmacists / Pharmacist Assistants	4
Research Manager and Assistants	3
Data capturers	5
Linkage Assistant	3
Admin Clerks	7
Counselors	1
Total	**30**

3.8. Data Collection Tools and Procedures

The choice of data collection methods in this study was determined by the sample size; the allotted time, available resources and the study objectives (Patton, 1990). The study relied on interviews and observation as primary data gathering tools. The use of these complementing methods in this research guaranteed the capturing of accurate attitudes and behaviours of different social actors because these methods cover up for the weaknesses characteristic in each other.

3.8.1. Semi-structured Interviews

The study used structured interviews to produce deep and rich information concerning the employees' attitudes and behaviour towards the use of the VEMR system at Ithembalabantu clinic in Umlazi, Durban. Thirty (30) interviews were scheduled through the clinic management. Cohen et al (2007) defines a structured interview as a normal extension of participant observation, involving the use of an unbending list of questions requiring precise responses to such questions. The semi-structured interviews are related to asking questions that require closed responses or open-ended responses (Cohen et al, 2007). The interviewer is not tied on a rigid list of questions and there is an opportunity for flexibility in the answers.

The open-ended question provides the researcher the chance to ask additional questions that are associated to the answers given. Cohen et al (2007) opine that the semi-structured interview is a very imperative tool for data collection since it provides the researcher further advantage of exploratory deeper, asking clarifying questions and debating with participants concerning their understanding of the phenomenon. When well-planned and appropriately conducted, semi-structured interviews generate in-depth data as they allow the researcher to probe further which increases the opportunity of gathering reliable information from the participants (Cohen et al 2011). Semi-structured interviews provide the possibility of obtaining sensitive information that is not easy to obtain using other methods.

According to Cohen et al (2011) semi-structured interviews do not entail participants to have the capability to handle difficult documents or long questionnaires but offers a chance for the researcher to help participants in answering difficult questions. Questions which are not clear to the participants can therefore be rephrased and follow up or probing questions are asked to assist participants to answer the questions. It was for these reasons that semi-structured interviews were utilised in this study anticipating getting usable data relating to the use VEMR system. The interviews were spread over a 21 days period. This method is based on Clark and Trethewy (2005) study.

In compliance with Punch's (1998) suggestions, an interview protocol was designed to direct the administration and implementation of the interviews to make sure there was consistency. Taking a hint from Myers (2009) interviews questions were designed in the way that made them answer the research questions and offer background information of the participants. The researcher presented himself as a leaner and part of the community who endeavored to learn

more about the VEMR system. To ensure confidentiality and anonymity of participants' personal details, the interview schedule questionnaire did not record personal information.

Kothari (2004) notes that face-to-face interviews are appropriate for intensive investigations thus the interviews were carried out face-to-face. These face-to-face interviews enabled the researcher to witness non-verbal evidence such as body language, gestures, facial expressions, and emotions of the participants. These clues explained what the participants expressed and resultantly, the researcher managed to get a better understanding of their attitudes. To ensure accuracy and a record of reference, all interviews were recorded manually on an interview schedule form and where necessary these were supplemented with written notes.

The interviews were conducted at scheduled times which were drawn in consultation with the participants. The interviews were conducted in settings that met confidentiality and privacy requirements. Appointments with the interviewees were also made in a formal and confidential manner. The researcher took a few minutes to establish a connection with the participants by introducing himself, and to obtain the informed consent. The English language was used during the interview process. Ithembalabantu clinic had a standard procedure that was followed during the interview process to avoid interfering with their patient workflow and clinical process.

The researcher was cautious of the potential flaws of semi-structured interviews that they are time consuming and that they are also likely to "subjectivity and bias on the part of the interviewer" (Cohen et al, 2007, p. 300). In precaution, the semi-structured interviews were properly scheduled and conducted which produced in-depth information that could not be produced by other methods. Interviews were also triangulated with observations so as to offset the weaknesses inherent in them through the strengths from observations. Also to accommodate Palmary's (2005) cautionary note on open-ended questions, that if not well managed the interview can seem 'disingenuous', the researcher took a facilitative role, to tactfully steer back participants from irrelevant digressions. For these reasons, this study's outcome represents the attitudes of the concerned participants.

3.8.2 Observations

Observation is a systematic data collection method to watch what the participants do, in which the researcher uses his sense to examine participants in natural settings or situations (Kawulich and Barbara, 2005). Paraasuraman (1991) explored different observation types including disguised versus non-disguised observation, human versus mechanical observation, direct versus in-direct observation and structured versus non-structured observation. This study adopted multiple observation techniques. First, the researcher employed non-disguised observation to get consent from the participants for the observations. Secondly, direct observation was used to observe real-time behaviour looking on how participants were using the VEMR system.

Finally, indirect observation was used to review the participants' practices with the VEMR system. The technique helped to uncover issues and activities that are normally covert and could not be uncovered with interviews or quantitative methods. The observation technique allowed the researcher to understand how participants are using the VEMR system, why they are exactly using it, and what they are trying to accomplish using the VEMR system.

The observations were spread over a period of three months and during the observation process, the researcher aimed to establish if the participant was using the VEMR system, how often the participant used the VEMR system, and the extent at which the participant was using the VEMR system. The researcher opted for overt participant observation in order to reveal his identity to the employees and ask for permission to observe and communicate the purpose to the respondents. Observation intentions were communicated a month before the actual observations and the plea was accepted without any reservations.

The direct and indirect observation techniques were used to understand how the VEMR system was being used at Ithembalabantu clinic, this involved an observation of participants in all the departements at Ithembalabantu clinic. Direct observation assisted the researcher to observe real time usage of the VEMR system while indirect observation assisted in reviewing the work that the participants had previously done using the VEMR system.

The purpose of this was to explore the effects of the VEMR system and to understand how and at wich level the VEMR system was being used. The findings of the observation were manualy recorded (note-taking) on observation forms by the researcher.

The key benefit of the adoption of the participants observations in this study was to allow the researcher to examine what respondents were actually doing, rather than what they said.

3.8.3. Research instrument design

Table 3.3 reveals the tools or instruments that the researcher designed to collect data from participants for each research question.

Table 3.3: Research instruments

Research Question	Data Source	Instrument
1. What is the individual employee's attitude toward the use of VEMR system at Ithembalabantu clinic?	All employees at Ithembalabantu clinic who are exposed to the use VEMR system	Interview schedule
2. How does the employees' intention to use the VEMR system influence the adoption of the VEMR at Ithembalabantu clinic?	All employees at Ithembalabantu clinic who are exposed to the use VEMR system	Interview schedule
3. Why do Ithembalabantu employees use the VEMR system?	All employees at Ithembalabantu clinic who are exposed to the use VEMR system	Interview schedule & Observation
4. How does the employees' VEMR system usage behaviour influence the adoption of the VEMR at Ithembalabantu clinic?	All employees at Ithembalabantu clinic who are exposed to the use VEMR system	Interview schedule & Observation

3.8.4. Data Analysis and Interpretation: Qualitative Analysis

Data analysis means the innovative and ambiguous process of organising, attaching meaning, interpreting and theorising the bulk of collected data through the search for general declarations among categories (Marshall and Rossman, 1999). Data analysis signifies the deductive and inductive logic that is applied to research hence it does not ensure in linear fashion (Silverman, 2000). The purpose of data analysis therefore is to make the information that has been accumulated during the research meaningful (Vithal & Jansen, 2010; Struwig & Stead, 2004). Implied in the views of Antonius (2003), two approaches explicitly qualitative and quantitative could be used in analysing data.

Data was analysed using the qualitative method in this study. The qualitative method is less standardised and comes in a collection of approaches unlike the quantitative method that applies more standardised and specialised sets of data analysis techniques (Myers, 2009). Kawulich (2004) established five qualitative data analysis approaches: thematic analysis, grounded theory, interpretative phenomenological analysis, discourse analysis, and narrative analysis. Thematic analysis classifies themes and patterns of significance through a dataset based on the study question. Braun and Clarke (2006:79) define thematic analysis as a qualitative technique for 'identifying, analyzing and reporting themes within data'. Thematic analysis implicates carefully reading the information while classifying themes that then become the groups of analysis (Braun and Clarke, 2006). Thematic analysis is a method that is more employed in ethnographic study and is usually adopted when researchers deal with coding data (Weston, *et al*. 2001) and does not employ any mathematical tool for data analysis (Silver and Lewins, 2014). Thematic analysis is concerned with interpreting human experiences, from emic perspective. Grounded theory analysis is generally conducted on social and psychological processes and focuses on structuring a model from data. Interpretative phenomenological analysis is conducted to describe how people interpret their real world and try to find understandings to the senses that events and experience hold for individuals. Discourse analysis is used to describe how a language is used, what is believed and why it might be said. Narrative analysis describes how people make senses using stories and try to find a unique insight carried by individuals to make meaning of their external and internal effort (Kawulich, 2004). This study adopted the narrative analysis because of its flexibility that allows going beyond mere descriptive, comparative and explanatory ends to discover employees' behaviour towards the VEMR system use stimulated the use of narrative analysis in this study.

Narrative analysis in this study involved carefully reading the field notes until the researcher was immersed in the data followed by the structuring and coding of field notes and observations. An elaboration of a set of generalisations was made followed by theory building and testing and finally the reporting and writing up of the research. With insight from Vithal and Jansen (2010), data analysis in this study involved: scanning and cleaning transcribed data as well as compiling and organising data into emerging themes and patterns. The researcher presented and interpreted qualitative data generated from the study using the narrative process to provide rich insights from the explanation of context from the participants at Ithembalabantu clinic. The influence of the narrative technique is based on the

fact that narrative recounting and narrative construction are ultimate human communication practices (Kawulich, 2004). Since this technique lies on personal experiences, it was adopted in this study to examine and elaborate the respondents' individual attitudes toward the use of the VEMR system, their intentions to use the VEMR system, what informed them to use the VEMR system, and their system usage behaviour influencing the adoption of the VEMR system.

Moule and Goodman (2014) explained that to analyse qualitative data, the researcher may possibly adopt the process of selecting and simplifying data from its preliminary field note. The research questions were presented in a narrative form with the inclusion of selected quotations that build a case in answering the research questions, and which directly illustrate responses to these questions (Vithal & Jansen, 2010). Since a qualitative study is likely to generate a huge quantity of raw data, data collection and analysis in this study were conducted concurrently to avoid the piling up of unanalysed data.

Open-ended responses were collected from respondents using semi-structured interviews. Due to the characteristics of the collected data, the analysis was therefore performed manually using the narrative technique. The researcher adopted the narrative technique to analyse qualitative data and to write up respondents' exploratory actions based on their experiences on the use of the VEMR system at Ithembalabantu clinic. Data in this study is presented through a rigorous use of tables and boxes of extracts from interviews in a bid to distance my voice from the respondents' voices.

3.8.5 Validity and Reliability

Qualitative research and analysis are constantly criticized for reliability matters; hence it is critical at this juncture to indicate on how matters of reliability and validity were guaranteed throughout the course of this study (Lacey and Luff 2007). McMillan & Schumacher (2006) define validity as the extent of similarity between the descriptions of the phenomena or problem and the actualities of the world. Patton (2001) concluded that validity and reliability of the results are two aspects that every person conducting qualitative research have to be worried about while conducting a research, examining results and judging the quality of the research.

Reliability is defined by Joppe (2000) as the degree to which the results are reliable over a period and a truthful representation of the whole population of the study. The research is confirmed to be reliable if the results of the research can be duplicated under a similar

approach (Joppe 2000). In qualitative research, reliability is examined by the trustworthiness to establish excellent quality studies (Seale, 1999). This means that the credibility of the study report lies at the heart of the concerns predictably conferred as validity and reliability.

Interviews and observations were triangulated in this study, which helped the researcher to reduce the regular bias encountered, and to interrogate the truthfulness of the participants' responses (Cohen, Manion & Morrison, 2013). To minimize validity threats in this research, an appropriate timeline was chosen, and the researcher ensured availability of adequate resources for the research (Cohen, Manion & Morrison, 2013). The researcher also ensured that appropriate instruments for data collection and appropriate representative samples were used. All research instruments were pre-tested and were moderated by the supervisor.

Silverman (2006) suggests that the best approach of controlling data for validity and reliability is to have a well-structured interview with similar format and order of words and questions for every respondent. This approach was applied in this research. During the process of data analysis detailed in chapter 4, the researcher avoided biased analysis of data and poor coding.

Babbie (2001) argues that there will constantly be a likelihood of errors in the design of the tool. Therefore, pretest of the instruments enables the researcher to check the completeness and appropriateness of the research instrument (Creswell 2003). The researcher pre-tested the research instruments (Interview schedules), with people from the target population. After the pre-test, adjustments were made to the research instruments as was deemed necessary. Noteworthy, the data that was collected during the pre-testing of the research instruments did not form part of the data that was considered for the study.

3.8.6. Ethical considerations

Ethics are standards, principles and guidelines followed by researchers when conducting research (Babbie 2001). Researchers are ethically obliged to observe the ethical considerations in social science research, even in cases where the participants are unaware of those ethics (Creswell 2003). In light of this, the researcher was indebted to respect and protect the rights, values, needs and desires of the participants throughout this study. The following ethical issues were observed to ensure full protection of the informants' rights.

Ethical clearance was obtained from the University of KwaZulu-Natal's Humanities and Social Science Research Ethics Committee (HSSREC) (see Annexure 3) after submission of the research proposal and all the protocols that would be taken in the study to ensure total

protection of the participants and those measures were observed to during this study. The gate keepers' authorization to conduct this study was also sought (Annexure 1). Silverman (2000) emphasises an open and honest interaction between the researcher and the participants in which all the elements of the study are fully disclosed. In this regard, the research participants had full details of the study clearly and unmistakably explained to them. No information was withdrawn from the participants and they were not misled in any way throughout this study. An information sheet that provided the purpose and nature of the study was provided to the participants after which informed consent for conducting interviews was obtained (See Annexure 2 for informed consent form).

Researchers have an obligation to protect research participants from psychological and physical harm (Myers 2009). The researcher ensured that the research participants were free from harm and unforeseen risks. All interviews were held in safe places at safe intervals. The participants were constantly reminded that they were in charge of their own degree of disclosure hence they could not comment on issues that were uncomfortable to them.

Researchers are also obliged to protect the identity of participants and prevent possible identity disclosure (Ritchie 2003). Aspects of secrecy, privacy and confidentiality that are interwoven with protection therefore took a vital stage during the period of this study. The researcher assured that the participants' identities in relation to this research remained anonymous through the use of pseudonyms.

3.9. Summary

This chapter discussed the processes and steps that were adopted in this research. Data collection and data analysis methods, the study area and the selection of participants. A qualitative approach of an exploratory case study research design was adopted in this research whereby semi-structured interviews and observations were used as data collection techniques. A non-probability sampling design, particularly purposive sampling was utilised in the selection of the research participants. The ethics that were observed to protect the participants during the research process have been described. Time allocated to the study and funds contributed to the limitations of this study. The following chapter (chapter 4) presents, discusses and analyses the empirical findings of this study.

CHAPTER 4

DATA ANALYSIS

4.1. Introduction

This chapter provides an inclusive demonstration, assessment and argument of the research findings that accrued from semi-structured interviews and observations that were conducted with Ithembalabantu employees. Data analysis was done using the narrative analysis technic as described in section 3.8.4. The research findings are analysed based on past studies under each research objectives as outlined in chapter 1:

1. To explore employees' individual attitude towards the use of the VEMR system at Ithembalabantu clinic in Umlazi, Durban.
2. To explore how the employees' intention to use the VEMR system influences the adoption of the VEMR system at Ithembalabantu clinic in Umlazi, Durban.
3. To understand how the employees' VEMR system usage behaviour influences the adoption of the VEMR at Ithembalabantu clinic in Umlazi, Durban.
4. To understand what informs the use of the VEMR system at Ithembalabantu clinic in Umlazi, Durban.

4.2. Demographics of participants

The primary objective of this study was to investigate the attitude and behaviour of healthcare workers towards the use of the VEMR system at Ithembalabantu clinic. A total of thirty (30) employees participated in this study. This section provides the demographic characteristics of the respondents with the aid of Table 4.1 below.

Table 4.1: Demographics of participants

Departments	Pharmacy	4	30
	Medical	2	
	Monitoring and Evaluation	8	
	Research	3	
	Patient Administration	6	
	Laboratory	3	
	Nursing	3	
	Psychosocial	1	
Profession	Doctors	2	30
	Nurses	5	
	Pharmacists / Pharmacist Assistants	4	
	Research Manager and Assistants	3	
	Data capturers	5	
	Linkage Assistant	3	
	Admin Clerks	7	
	Counselor	1	
Years of employment in the position	0-1	3	30
	2-5	18	
	6-10	8	
	11 and above	1	
Years of experience using VEMR	0-1	12	30
	2-5	14	
	6-10	4	
	11 and above	0	
Total of participants	**30**		

4.3. Data presentation and interpretation

Qualitative data presentation and interpretation is a process whereby the researcher descriptively examine data to understand it and make sense of it and draw lessons learned (De Vos, *et al.*, 2011:416). The approach that is followed in this section to transform and organise data was outlined in the research methodology section.

4.3.1. Employees individual attitude towards the use of the VEMR system

The following five predictors (sub-questions) were derived from this construct to allow the researcher to better explore the attitude of each employee towards the use of the VEMR system at Ithembalabantu clinic:

Q1.1: Do you think the VEMR system is an appropriate tool for healthcare worker to use?
Q1.2: Do you like the purpose of using the VEMR system?
Q1.3: Do you find the VEMR system useful for your patient care and management?
Q1.4: Are you very interested in the use of the VEMR system?
Q1.5. Do you prefer using the VEMR system than paper based?

The objective of these predictors is to explore the individual attitude towards behaviour that is influencing the use of the VEMR system at Ithembalabantu clinic as was illustrated in Feshbein and Ajzen's Theory of Reasoned Action (Fishbein & Ajzen, 1975). The participants' views on each sub-question are transcribed and analysed below.

4.3.1.1. VEMR system as an appropriate tool for healthcare worker to use

The aim of this sub-question was to explore what the employees at Ithembalabantu clinic think about the VEMR system, if they perceive it as an appropriate tool for healthcare workers to use. This helps to understand the perceived key benefits and challenges of the VEMR system use from the medical professionals' perspective which helps in the systemisation of the strength and weaknesses of the VEMR system in relation to the healthcare workers' attitude. Table 4.2 provides participants' views from each department.

Table 4.2: Participants view the VEMR system as an appropriate tool for healthcare workers

Department	Respondents	Response
Pharmacy	4	No, time consuming and inconvenient
		Yes, because it is a system that allow all healthcare workers to access patient information in one source
		Yes, it is because every healthcare facility needs to have a working system
		Yes
Medical	2	Yes, it contains relevant patient related information
		Yes, it is when integrated for patient flow between services
Monitoring and Evaluation	8	Yes, I can track the clients with the VEMR
		Yes, it helps store information for patients
		Yes, it makes it easy to work, It saves time as well
		Yes, it is not time consuming therefore less time to create clinical information for patients
		Yes, because it shows everything about the patients
		Yes, because it is much safer than recording in registers
		Yes, it keeps all the records safe and its fast to track information
		Yes, it helps to easily file and retrieve patient information
Research	3	Yes, it makes it easier to find the patient information and it is not difficult to navigate through the system.
		Yes, if used properly, it helps in keeping patient information
		Yes, because it helps when checking for patient information
Patient Administration	6	Not exactly, it doesn't provide appointment dates
		Yes
		Yes, helps to book for appointments and record patient information
		Yes, because it keeps safe information of the clients
		Yes, VEMR is a very easy tool to use
		Yes, it is much easier to identify any records required

Table 4.2: Participants view the VEMR system as an appropriate tool for healthcare workers (continued)

Department	Respondents	Response
Laboratory	3	Yes, it minimizes time, and it is convenient for healthcare workers
		Yes, it makes life easy
		Yes
Nursing	3	Yes, it is easy to record information for patients
		Yes, it makes it easy to search for the results
		Yes, but need proper training to get positive feedback from the system
Psychosocial	1	Yes, for the safe recording of patients' assessments

75% of the respondents at the pharmacy think that the VEMR system is an appropriate tool for healthcare workers while 25% think it is not an appropriate tool to be used in their department. However, all the respondents (100%) in the medical, monitoring and evaluation, research, patient administration, laboratory, nursing and psychosocial departments think that the VEMR system is appropriate for healthcare workers.

Approximately 95% of the respondents agreed that the VEMR system is an appropriate tool for healthcare workers to use. 80% of the respondents indicated that, with the VEMR system, it is easy to record, store and retrieve patients' information. All (100%) of the respondents from the nursing and laboratory departments emphasized that the VEMR system makes their life easier, saves time and is a convenient system for healthcare workers to use as reflected in additional catchy accounts in narrative 4.1 below.

Narrative 4.1. The VEMR system as an appropriate tool for healthcare workers

"Yes, the VEMR really saves time; manually recording clinical information for patients is soul-destroying."

"Yes, it allows us as healthcare workers to access patient information in one source that is perfect to be honest."

"Yes, it is a highly needed perfect working electronic system."

"Yes, you easily find the patient information; it is so easy to navigate through the system."

"Yes, with proper training we are guaranteed of positive results from the system I tell you."

Interviews with nursing and laboratory departments healthcare workers: 10/05/2018

However, 4% of the respondents think that the VEMR system is a time-consuming and an inconvenient system and therefore not an appropriate tool for the pharmacy. 10% of the respondents could not elaborate on their positivity regarding the reason why they think the VEMR system is an appropriate tool for healthcare workers. This may impact on the validity of the respondent but have no statistical effect on the data.

4.3.1.2. Do you like the purpose of using the VEMR system?

The objective of this sub-question was to explore if the employees at Ithembalabantu clinic like the purpose of using the VEMR system. This sub-question was included to ensure an understanding of the employees' views on the proposed usefulness of the VEMR system as these determine their individual attitudes towards the system. Table 4.3 illustrates participants' views from each department.

Table 4.3: Participants like the purpose of using the VEMR system

Department	Respondents	Response
Pharmacy	4	Yes, it creates a database where patient information can easily be found
		Yes, because it minimizes patient movement in the clinic. A doctor can see all the information they want
		I do like the purpose, but think it needs to be more user friendly
		Yes, for dispensing medication
Medical	2	Yes, storage of patient records is important, and it allows easy access
		Yes, it is when integrated in the patient flow, between services

Table 4.3: <u>Participants like the purpose of using the VEMR system (continued)</u>

Department	Respondents	Response
Monitoring and Evaluation	8	Yes, it saves time
		Yes, it makes appropriate information readily available
		Yes, because I feel it is very important in our facility
		Yes, clinicians can easily access and share patients' medical records
		Yes, because it is user friendly
		Yes, it is the best way of keeping records because registers get misplaced
		Yes, it makes it easy to get information of the patients
		Yes, it makes it easy when tracing and following up on patient information
Research	3	Yes, because it assists me in my work area, especially with patients whose information files are lost
		Yes, it is easy to pick patients who open files more than once
		Yes, it helps when tracing missing information
Patient Administration	6	Yes, I like the purpose
		Yes, it makes us do our work easily
		Yes, easy to register patients
		Yes, because it makes things much more easier
		Yes, for the easy patient management and information storing
		Yes, VEMR maintains and keeps the records of all registered patients
Laboratory	3	Yes, for the safety keeping of the information
		Yes, easy to access file numbers even if patients do not have their cards
		Yes, it is easy to create patients' files
Nursing	3	Yes, easy to record information for patients
		Yes, it makes it easy to search for the results
		Yes, but needs proper training to get positive feedback from the system

Table 4.3: <u>Participants like the purpose of using the VEMR system (continued)</u>

Department	Respondents	Response
Psychosocial	1	Yes, easy recording and access of patient information

All respondents (100%) indicated that they like the purpose of using the VEMR system. They indicated that using the VEMR system makes their job much easier and helps them to easily record, search, update and safely store information for the effective management of their patients. Supplementary rich data from selected respondents regarding this is provided in narrative 4.2 below:

Narrative 4.2. Compliments of the purpose of using the VEMR system

> *"Yes, easy storage of patient records that is easily accessed."*
>
> *"Yes, it ensures an easy identification of staff performance and it reduces waiting time for patients."*
>
> *"Yes, it minimizes patient movement in the clinic. Doctors can see all the information they want directly from the VEMR system. Imagine how useful this is especially in small clinics."*
>
> *"Yes, some patients its either they lose their cards or they leave them at their houses, with the VEMR system, that won't matter anymore given the easy retrieving of patient files even if patients do not have their cards that is enabled by the VEMR system."*
>
> *"Yes, I refer to it as tracing and following up on patient information made easy."*
>
> *"Yes, it really assists in our job especially with patient information when patients' files are misplaced."*
>
> *"Yes, it is the best way of saving healthcare workers from the stress that comes with misplacing registers."*
>
> **Interviews with Ithembalabantu healthcare workers from pharmacy, medical and nursing departments: 12/05/2018.**

Furthermore, 4% of respondents who like the purpose of using the VEMR system suggested that the system be more users friendly.

4.1.1.3 Do you find the VEMR system useful for your patient care and management?

The aim of this sub-question was to explore if the employees at Ithembalabantu clinic find the VEMR system useful for their patients care and management. An understanding of the usefulness of the VEMR system regarding healthcare work from health workers' perspectives was of great essence in the understanding of such workers' overall attitude towards the system. Ithembalabantu healthcare workers' views regarding the usefulness of the VEMR system determined their overall attitude towards it. Table 4.4 illustrates participants' views from each department.

Table 4.4: Participants find the VEMR system useful for patient care and management

Department	Respondents	Response
Pharmacy	4	Yes, it creates a database where patient information can be easily found
		Yes, I find the VEMR useful. Once data is captured regarding patients' information; nurses, doctors also have that information
		It is useful for our patients, and it makes it easier to trace our patients' information
		Yes, but difficult to use
Medical	2	Yes, it monitors patients' treatment and assists in case where tangible files are misplaced or lost
		Yes, all patient information is accessible via VEMR
Monitoring and Evaluation	8	Yes, the VEMR is useful for our patient recording
		Yes, if all data is entered correctly and timeously, it can be useful
		It is useful because it saves us time, the patient information is safe
		Yes, the safe keeping of medical records and tracking of patients

Table 4.4: Participants find VEMR system useful for patient care and management (continued)

Department	Respondents	Response
		Yes, it is easy to retrieve information for patients and to run reports
		Yes, sometimes pages from the registers get loose and tear up so VEMR is better and safer
		Yes, if they lose their blue cards and forget their file numbers, we can easily use the system to get their information
		Yes, saves time when looking for a patient file
Research	3	No, since the nurses and doctors do not update it during patients' visits. Therefore, it is not up to date
		Not really, because data capturers make mistakes and, in most cases, the system doesn't pick it up
		Yes, their files are safe
Patient Administration	6	Yes, it enables us to capture and retrieve patients' information and do follow-ups
		Yes, especially if they lose their appointment cards with the required information. We are able to track their information
		Yes, helps to confirm files numbers
		Yes, because it is fast and easy to track a patient and easy for blood results
		Yes, it's easy to trace the Patient using VEMR
		Yes, it's useful due to tracking and retrieving the needed information
Laboratory	3	Yes, because it saves time for the patient
		Yes, to retrieve patient information
		Yes, it helps to check missing results easily
Nursing	3	Yes, VEMR makes it easy to retrieve patient history
		Yes, easy to access patient information and results

Table 4.4: <u>Participants find VEMR system useful for patient care and management (continued)</u>

Department	Respondents	Response
		Yes, if used properly, and have access to ongoing training and support
Psychosocial	1	Yes, it helps to prepare for the clients that are expected to come for their appointments

The data reveals that 95% of the respondents find the VEMR system useful for their patient care and management. Doctors indicated that the VEMR system monitors patient treatment and assists them in cases where tangible files are misplaced or lost. The nursing and pharmacy departments indicated that it makes it easy to retrieve patients' results, medical history and update missing information. Narrative 4.3 below provides additional respondents' accounts.

Narrative 4.3. The VEMR system's usefulness in patient care and management

> *"It is useful for our patients, and it makes it easier to trace our patient's information."*
> *"The system makes the whole process of tracing patients' information easier."*
> *"The stress that you go through when pages from the registers get loose and tear up, the VEMR system is better and safe."*
> *Yes, it becomes possible to prepare for expected clients."*
> *"An easy way of retrieving patients' information."*
> *"Not really, I am much worried about the mistakes that are made by data capturers in most cases."*
> *"Very useful even though it is difficult to use."*
> **Interviews with Ithembalabantu healthcare workers: 20/05/2018.**

80% of the respondents from the Administration as well as those from the Monitoring and Evaluation departments find the VEMR system more useful for capturing, retrieving and updating patients' information. 70% of these respondents also indicated that the system is fast and that it enables healthcare workers to trace patients' information and to confirm file numbers especially when patients lose their appointment cards. 40% of the respondents

recommended that data should be captured timeously across the facility for the system to be useful and that ongoing training and support should be provided.

4.1.1.4 Are you very interested in the use of the VEMR system?

The objective of this sub-question was to explore if the employees at Ithembalabantu clinic are interested in the use of the VEMR system. Self-interests are closely related to attitudes since humans like and adopt systems that are consistent with their attitudes. This sub-question therefore provided vital information about healthcare workers' attitudes towards the VEMR system. Table 4.5 illustrates participants' views from each department.

Table 4.5: Participants are interested in the use of the VEMR system

Department	Respondents	Response
Pharmacy	4	No, it's time consuming, so many steps
		Yes, because it minimizes paper on the patient file, and everything is done electronically
		No, it is not easy to use it and we didn't use it for a long time
		Yes
Medical	2	Yes, it is a simple system to use and keep patient records
		Yes, however some other departments are not using the system which makes it difficult
Monitoring and Evaluation	8	Yes
		Yes, because it will assist me with information when doing reports
		I am very interested to know or learn new things
		Yes, I think it will make my report more accurate
		Yes, I am able to track the patients quickly and easily whether there is a default or not
		Of course, we cannot find patients' information laying around; it is only the people with access who can see what is inside
		Yes, it is an interesting software because it teaches us to be careful
		Yes

Table 4.5: <u>Participants are interested in the use of the VEMR system (continued)</u>

Department	Respondents	Response
Research	3	No, because this system has been down for a long time, no one is maintaining it
		Not sure
		Yes, I am interested
Admin	6	Yes, its user friendly
		Yes, I am interested
		Yes, it is important
		Yes, because there are many things to learn and do to find a patient
		Yes, I am interested
		Yes, this results in a moving forward system in database information and in reports as whole
Laboratory	3	Yes, it makes our work very easy
		Yes, I am interested
		Yes, when VEMR is used effectively
Nursing	3	Yes, it gives a complete picture of client information
		Yes, I am interested
		Yes, as an alternative system to Tier.Net
Psychosocial	1	Yes, for my own performance in my work

Data reveals that 88% of the respondents are very interested in the use of the VEMR system. 80% of the respondents from the medical department indicated that the VEMR system is a simple system to use for storing patient information although some other departments are not using the system which makes it difficult for them to continue using the VEMR system.

100% of the respondents from the nursing department are also interested in the use of the VEMR system as it gives them a completed picture of clients' information and they use it as an alternative system to the Tier.Net.

Respondents from the patient administration as well as those from the monitoring and evaluation departments said they are interested in the use of the VEMR system because it is user friendly; it allows them to easily search for patients' information and to easily and

accurately generate their reports. 50% of the respondents reported their use of the VEMR system as a learning tool to better perform their work. Additional verbatim descriptions regarding Ithembalabantu healthcare professionals' interest in the use of the VEMR system are provided in narrative 4.4 below.

Narrative 4.4. Participants' interest in the use of the VEMR system

> *"Yes, so interested, I am able to easily track participants' information."*
> *"Yes, it is a very interesting software because it teaches us to be more careful "*
> *"I am so in love with this system, it saves us from tiresome paperwork."*
> *"What more can I ask for in my career? The system is just perfect, I strongly like it."*
> **Interviews with Ithembalabantu healthcare workers: 20/05/2018.**

80% of the respondents from the remaining departments indicated an interest in the VEMR system because it minimizes papers on the patient file and everything is done electronically which makes their work very easy. 60% of the respondents are interested in the VEMR system because of their own work performance.

However, approximately 10% of the respondents said that they are not interested in the use of the VEMR system. They find the system as time consuming as it has so many steps to follow. One respondent indicated that the system is not easy to use and that they have not used it for a long time. Another respondent indicated that the system has been down for a long time and no one is maintaining it. 30% of the respondents could not elaborate on their responses though they had indicated that they are interested in the use of the VEMR system. These respondents raised concerns of having operational issues with the VEMR system and therefore they have not used it for a long time. Although this number may impact on the truthfulness of the information, it however does not have any statistical effect on the data.

4.1.1.5 Do you prefer using the VEMR system than paper based?

The aim of this sub-question was to explore if the employees at Ithembalabantu clinic prefer using the VEMR system more than other paper-based systems. Healthcare workers' preferences affect system uses and ultimately attitudes towards the overall system hence the essence of this sub-question in this study. Table 4.6 illustrates participants' views from each department.

Table 4.6: Participants prefer using the VEMR system than paper based

Department	Respondents	Response
Pharmacy	4	Yes and No, paper based is easy, but files get missing
		Yes, papers get lost but the VEMR system has back-up, so information is always available
		I do prefer using the system if only they can make it user friendly
		Yes, it's easy to use
Medical	2	I prefer both simply as we still have the manual filing system. However, the VEMR alone is still sufficient
		Yes, but it becomes difficult as the VEMR is not used in other departments.
Monitoring and Evaluation	8	Yes, papers are not easy to archive
		Both because at times information provided by the VEMR won't be enough
		It is faster than using papers hence saves us time
		Yes, the less paperwork the better
		Yes, VEMR is able to store patients' details. Paper based is not okay as it can be lost easily
		Yes, patient information is easily accessible to all.
		Yes, papers get lost and it is hard to get information once it is lost but with the VEMR, everything is fast
		Yes, it makes it easy to trace a patient using VEMR than paper
Research	3	Yes, because it is electronic, so data is safe and easily accessible
		Both for verification purposes

Table 4.6: <u>Participants prefer using the VEMR system than paper based (continued)</u>

Department	Respondents	Response
		Yes, information can be retrieved at any time and files cannot be misplaced
Patient Administration	6	Yes, because it has back up if papers are lost or damaged.
		Of course, it always makes our work neat and we don't lose our clients' information if using the VEMR system.
		Yes, it's fast
		Yes, because it keeps records of everything that we do
		Yes, it's easy to retrieve patient files using VEMR
		I prefer VEMR because it makes it easy to search and find any required information while paperwork is so demanding
Laboratory	3	I prefer using the VEMR as paper does get lost sometimes
		Yes, cause papers get lost easily
		Yes, but we are required to use alternative lab systems than VEMR
Nursing	3	Yes of course, easy to store patient files
		Yes, for my own work performance
		I prefer VEMR use because of handwriting eligibilities
Psychosocial	1	Yes, for accuracy and information safety

All respondents (100%) agreed that they prefer using the VEMR system than the traditional paper-based system. The medical and pharmacy departments however indicated that they prefer using both VEMR and paper simply because some departments are using the VEMR system. The VEMR is being used as a backup system in cases where papers are lost or spoiled. 80% of the respondents perceived the VEMR system to be more efficient for storing and retrieving patients' information as evidenced in additional descriptions in narrative 4.5 below.

Narrative 4.5. Participants' preference in the VEMR system use over paper-based systems

> *"I prefer VEMR because it makes it easy to search and find any required information and paper has so much work."*

"I prefer both since we still have a paper-based filing system. However, the VEMR alone is still sufficient."

"I prefer using VEMR because it covers up for all handwriting limitations."

"Of course, it always makes our work neat and we don't struggle when searching for our patients' information when using the VEMR."

"Yes, for accuracy and safety of information."

"Yes, information can be retrieved at any time and files cannot be misplaced."

"Yes, papers get lost and it's hard to get information once it is lost, but with the VEMR everything is fast."

Interviews with Ithembalabantu healthcare workers: 01/06/2018.

90% of the respondents indicated that the VEMR system is fast, makes it easy to trace information, saves their time and is consistent and 70% indicated the flaws of the traditional paper based system, including paper losses and time challenges when retrieving patients' information or files.

4.3.2. Employees subjective norms towards the use of the VEMR system

The predictors below were derived from this construct to allow the researcher to explore how the employees' intention to use the VEMR system influences the adoption of the VEMR system at Ithembalabantu clinic:

Q2.1: Does the management of the clinic recommend you to use the VEMR system?

Q2.2: Does your feeling of responsibility towards your patients influence you to use the VEMR system?

Q2.3: Do your colleagues think you should use the VEMR system?

Q2.3: Are you already trained to use the VEMR system?

Q2.4: Would you put every effort to adopt the usage of the VEMR in your work?

The objective of these predictors is to determine the subjective norms from the employees that are influencing the adoption of the VEMR system at Ithembalabantu clinic as was illustrated in Fishbein and Ajzen's Theory of Reasoned Action (Fishbein & Ajzen, 1975). The participants' responses to each sub question are transcribed and analysed below.

4.1.2.1 Does the management of the clinic recommend you should use the VEMR system?

The aim of this sub-question was to determine if the management recommended the employees at Ithembalabantu clinic to use the VEMR system. This aids in the understanding of the management's views and attitudes of the system as well as their influences in the overall employee norms towards the VEMR system use. Table 4.7 illustrates participants' responses from each department.

Table 4.7: Management recommends the VEMR system use

Department	Respondents	Response
Pharmacy	4	Yes, it will help with patient information
		Yes, they went for training and saw the importance of the system and installed it on our computers
		Yes, but we only used it for 2 months and it never worked
		No, I was not recommended to use VEMR
Medical	2	Yes, they held training for the system in 2017 and support the use of the system.
		Yes, they organised training for staff to be able to use the system
Monitoring and Evaluation	8	Yes, for data capturing
		Yes, it is the management of the clinic that recommended us to use the VEMR system
		The management really recommends us to use VEMR to avoid paperwork difficulties
		No, I was only recommended to use Tier.Net
		NO, I only used it once a month because we are currently using Tier.Net
		Yes, for patient confidentiality
		Yes, they recommended me because I have computer skills

Table 4.7: <u>Management recommends the VEMR system use (continued)</u>

Department	Respondents	Response
		Yes, though we mostly use Tier.Net for our patients follow-ups
Research	3	Not necessarily, they recommend Tier.Net and that is the system that we currently use
		Yes, in capturing patient information and patient clinic visits
		Yes, to cross check if the patient was registered
Patient Administration	6	Yes, VEMR is part of my daily job description
		Yes, it is part of my job description
		Yes, it's part of my job description
		Yes, because we capture information, and it is easy to find patient files and lost information
		Yes, VEMR was a tool to use as part of my job description
		Yes, this is based on the department's recommendations
Laboratory	3	Yes, for quality purposes
		Yes, to update patient blood results.
		Yes, we use both VEMR and the NHLS system
Nursing	3	Yes, for the safety of patient information
		Yes, the management recommended the VEMR
		No, I use VEMR for my own administration work
Psychosocial	1	Yes, to record patient assessments

Majority of the respondents (86%) indicated that the management of the clinic recommended them to use the VEMR system. 90% of the respondents from the medical, pharmacy, nursing and psychosocial departments reported of receiving training on the use of the VEMR system for patient assessments and encounters.

60% of the respondents from the patient administration as well as the Monitoring and Evaluation (M&E) departments indicated that the VEMR was initially part of their job description. However, 30% of the respondents from the M&E and research departments

indicated that they had stopped using the VEMR system as they were introduced to the Tier.Net as their recommended system to use for patient information management.

60% of the respondents who indicated that the management did not recommend them to use the VEMR system reported using the system for their own administrative work and to cross check patients' information.

4.1.2.2 Does your feeling of responsibility towards your patients influence you to use the VEMR system?

The objective of this sub-question was to determine if the feeling and responsibility towards the patients influenced the employees at Ithembalabantu clinic to use the VEMR system. This study hypothesised that responsibility feelings determine system use hence the importance of this sub-question to test this hypothesis so as to understand Ithembalabantu healthcare workers' subjective norms towards the VEMR system. Table 4.8 illustrates participants' responses from each department.

Table 4.8: Participants are influenced by their feeling of responsibility toward their patients to use the VEMR system

Department	Respondents	Response
Pharmacy	4	Yes, because patients wait long when using the system. I prefer not to use it
		Yes, some patients come late to the clinic and some come rushing to attend other things so VEMR makes these situations easy to handle
		No for now we are using paper-based systems and it works faster than the VEMR system
		No
Medical	2	No, the VEMR is a system which should be used, regardless of patient responsibility
		No, my responsibility towards my patient is important regardless of the system

Table 4.8: <u>Participants are influenced by their feeling of responsibility toward their patients to use the VEMR system (continued)</u>

Department	Respondents	Response
Monitoring and Evaluation	8	Yes, to save patient information safely
		Yes, because patients' information is captured and stored confidentially
		VEMR makes thing to be easy
		Yes, because I deal with a lot of data it will make my job more easier and accurate
		Yes, it is my responsibility to keep patient details safe in the database
		Yes, sometimes the patients fight with us when their files are missing, so with the system it is easy to view and make temporary files
		Yes
		Yes, to ensure the patient information is safe and easily accessible
Research	3	Yes, the clinic filing system is poor so for all the patients under the research study whose files were lost, I use VEMR to get their details
		No
		No
Patient Administration	6	Yes
		Yes, safety of patient information
		Yes, for safe keeping of patient files
		Yes, it makes things easier
		Yes, patient information is safe and easily accessible
		Yes, VEMR is fast and quick to assist in any way
Laboratory	3	Yes, because it is quicker for me
		Yes, to capture, store and correct errors of patients' information
		Yes, to trace and record lab results

Table 4.8: <u>Participants are influenced by their feeling of responsibility toward their patients to use the VEMR system (continued)</u>

Department	Respondents	Response
Nursing	3	Yes, easy and safe storage of information
		Yes
		Yes, I am able to track medication without any hard copies
Psychosocial	1	Yes, but we have no computer at the moment in our department

Of the 30 respondents interviewed, 23 of the respondents (76%) indicated that their feelings and responsibility towards their patients influenced them to use the VEMR system. These respondents confirmed using the VEMR system to ensure that their patients' information is safe and easily accessible. 72% of the respondents also said that the VEMR system is fast and quick to assist them in tracking medication in the absence of hard copies. Additional verbatim responses to this are provided in narrative 4.6 below.

Narrative 4.6. The influence of participants' feelings of responsibility on the VEMR system use

"Yes, all situations are easily handled with this system, so I often use it to store patients' information confidentially."

"Yes, I have to ensure that all patients' files are intact and should retrieve all the missing information so the VEMR system is the easy way to go."

"Yes, this clinic's filing system is so poor, files are often lost, so I always have to use the VEMR to get their details."

"Yes, my responsibility to efficiently capture and store patient details confidentially compels me to utilise the system."

"No, my responsibility towards my patients is important regardless of the system."

"The way patients have to wait long when using this system, no I don't prefer using it to be honest. I find paper based systems quick than VEMR systems"

Interviews with Ithembalabantu healthcare workers: 06/06/2018.

Noteworthy, 85% of the respondents from the medical and pharmacy departments indicated that their feelings and responsibility towards their patients did not influence then to use the VEMR system.

20% of the respondents could not elaborate on their responses as they indicated that their work did not involve direct interaction with the patients.

4.1.2.3 Do your colleagues think you should use the VEMR system?

The objective of this sub-question was to determine if other colleagues thought that the employees at Ithembalabantu clinic should use the VEMR system. This sub-question was useful in the determination of the influences that colleagues' views and attitudes had on overall individual attitudes and subjective norms towards the VEMR system use. Table 4.9 illustrates participants' responses from each department.

Table 4.9: Participants are influenced by colleagues to use the VEMR system

Department	Respondents	Response
Pharmacy	4	No, time wasting and many steps to follow
		In the pharmacy, VEMR is not that important because we have our own dispensing systems
		No, for now we are using paper based and it works faster than VEMR system
		No
Medical	2	Yes, it is easy to use system and tracks patients
		Yes, the main challenge is working together with other departments
Monitoring and Evaluation	8	Yes, it was part of my job description
		Yes, for easy access of information when compiling reports
		We know that the VEMR is very important and that our data is very safe
		The issue has never been discussed
		No, no one ever influenced me to use VEMR

Table 4.9: <u>Participants are influenced by colleagues to use the VEMR system (continued)</u>

Department	Respondents	Response
		Yes, it the best way to keep record safe
		Yes, because I am good at it and I understand it very well
		No, because we are using Tier.net in our department to trace patients
Research	3	Yes, for the purpose of verifying patient information
		No, my work doesn't rely on VEMR
		Yes, sometime when there is some information that you cannot find
Patient Administration	6	Yes
		Yes, as part of my job
		Yes
		Yes, because if the patient has lost the card, the systems makes it possible to find their file
		Yes, as part of my job requirement
		Yes, for the sake of keeping records and in assistance to them
Laboratory	3	Yes, it also convenient for my colleagues because it saves time
		Yes, useful to everyone at the clinic
		Yes, for clinicians to get access to lab results
Nursing	3	Yes, for continuity of patient care
		Not sure
		Yes
Psychosocial	1	Yes, for continuity of patient care

Most respondents (80%) said their colleagues think they should use the VEMR system for the continuity of patient care. 75% of these respondents said the VEMR system is convenient for their colleagues because it is easy to use, saves time, tracks patients, corroborates paper-based patient information and is useful for everyone at the clinic. 90% of the respondents further said that the VEMR system is very important and is the best way to store patient data. It

makes it easy for them to access information when compiling reports and to retrieve lost patients information.

One of the respondents (3%) raised the limitation of working together with other departments. 70% of the respondents indicated that they have other systems that they were using in various departments. For instance, in the M&E they are using the Tier.Net, the laboratory is using the National Health Laboratory Service (NHLS) system and there is also a customised research database for the research department and the traditional paper based system in all other departments.

However, all respondents (100%) from the pharmacy department said they don't think they should use the VEMR system. Further probing into this revealed that over-reliance on manual dispensing systems and insufficient recommendations from the management were the reasons behind this response. As such, as shall be noted later on, the pharmacy department is recommended to undertake more VEMR system awareness campaigns and recommend its use.

Narrative 4.7. ***Colleagues' influence on the VEMR system use***

> "No, *VEMR system is time wasting and has many steps to follow and besides everyone here is comfortable using paperwork, following suit is the best option."*
> *"In the pharmacy, VEMR is not that important because we have our own manual dispensing system that is utilised by everyone."*
> *"Teamwork is the best; we are used to our own way of doing things as a department and will continue doing it that way until we agree on the change."*
> **Interviews with selected respondents from Ithembalabantu Pharmacy department: 25/06/2018.**

However, about 17% of the respondents did not elaborate on their responses. Though some believed they should use the VEMR system, 80% of the respondents had stopped using the VEMR as they adopted alternative systems.

4.1.2.4 Are you already trained to use the VEMR system?

The aim of this sub-question was to determine if the employees at Ithembalabantu clinic are already trained to use of VEMR system. The study hypothesized training on the VEMR system use to be one of the determinants of individuals' subjective norms with regards to the system use. An understanding of the training details of the respondents' details thus aids in the understanding of the respondents' broad subjective norms towards the system use and the factors that influence such norms. Table 4.10 below illustrates participants' responses from each department.

Table 4.10: Participants are already trained to use the VEMR system

Department	Respondents	Response
Pharmacy	4	Not really, on the job training
		Yes, I did go under training to use the VEMR
		We were trained
		No
Medical	2	Yes, training was held in 2017
		Yes, I attended the training
Monitoring and Evaluation	8	No
		No
		I am trained to use VEMR
		No
		No, I have not been trained but they show few things in VEMR
		Yes
		Yes, it has been so long since I used the software, and we are trained about new things
		Yes, I was trained
Research	3	No, I learned from a colleague
		No
		I was trained a little bit before it was stopped in our department

*Table 4.10: **Participants are already trained to use the VEMR system (continued)***

Department	Respondents	Response
Patient Administration	6	Yes
		Yes
		Yes
		No, but have learned more things from using it
		Yes, I was trained
		Yes, I was trained, and I am up to date with the system
Laboratory	3	Yes, for more information
		Not really, received instructions from a colleague
		Yes, I was trained by a colleague
Nursing	3	Yes, I was trained
		Yes
		No
Psychosocial	1	Yes, I was trained

Approximately 64% of the participants confirmed that they received appropriate trained to use the VEMR system. About 15% were not formally trained but received instructions from their colleagues and are able to use the VEMR system on their own while 21% of the respondents did not receive any form of training or instruction but they learned to use the VEMR system on their own. 50% of the respondents emphasised the need for ongoing training and support give that some users were reported to be shunning the VEMR system use various departments. In consideration of this response as shall be noted later on, selected departments are recommended to constantly train and support their employees with regards to the VEMR system use.

4.1.2.5 Would you put every effort to adopt the usage of the VEMR in your work?

The aim of this sub-question was to determine if the employees at Ithembalabantu clinic would put every effort to adopt the usage of the VEMR system in their work. An understanding of the employees' willingness to adopt the system as well as the amount of effort that they are ready to invest in the usage of the system is essential in ascertaining individual perceptions and behaviours towards the VEMR system. Table 4.11 illustrates participants' responses from each department.

Table 4.11: Participants put every effort to adopt the usage of the VEMR in their work

Department	Respondents	Response
Pharmacy	4	NO, it has so many gaps, not a really usable system
		Yes, I would for the clinicians because it makes life easy for them and it also saves patient time
		No
		If trained to use it
Medical	2	Yes, I would
		Yes, I have been continuously using the system
Monitoring and Evaluation	8	Yes
		Yes, because at times it can be hard to compile reports using papers
		Yes, because it helps us at our working place. It is really different from the paper things
		Yes, it will make work more easier
		Yes
		Yes
		Yes
		Yes
Research	3	Yes, If I understand the system better
		Yes, it will assist in picking defaulters and for follow-ups
		Yes, because it helps us with getting some missing patient information
Patient Administration	6	Yes
		Yes
		Yes
		Yes, because it keeps the information safe and recorded
		No, I no longer work as a clerk
		Yes, due to the old system we were using before, it is much needed for new technical programs

Table 4.11: <u>Participants put every effort to adopt the usage of the VEMR in their work (continued)</u>

Department	Respondents	Response
Laboratory	3	Yes, for quality purposes and for saving time
		Yes
		Yes, but it duplicates our work using parallel systems
Nursing	3	Yes, if implemented correctly
		Yes
		Yes, if trained
Psychosocial	1	Yes, if VEMR is updated and installed in our department

Most of the respondent (90%) showed interest in putting every effort to adopt the usage of the VEMR system in their work because it keeps the information safe and easily accessible. 70% of the respondents had been continually using the VEMR system while 30% had reversed back to their old paper-based system. Additional verbatim responses to substantiate this are proffered in narrative 10 below.

Narrative 4.8. Participants' efforts to adopt the usage of the VEMR system in their work

> *"Yes, I would, and I always do for the clinicians because it makes life easy for them and it also saves patient's time."*
>
> *"Yes, I am ready to do anything possible to use this system because it will assist in picking up defaulters and it will make follow-ups stress-free."*
>
> *"Yes, because it will definitely help us get all the missing patient information."*
>
> **Interviews with selected healthcare workers at Ithembalabantu clinic: 25/07/2018.**

10% of the respondents however claimed that the VEMR system duplicates their work as they should use the manual paper system as well. A further 15% of the respondents promoted that the VEMR system had too many gaps and that it was not a usable system for them. 40 % of these respondents did not elaborate on their responses while 85% of the respondents indicated their interest in putting every effort to adopt the usage of the VEMR system. Although this proportion might be high to validate the responses, this did not impact on the statistical aspect of the findings.

4.3.3. Employees' VEMR System usage behaviour to influence the adoption of the VEMR system

To understand how the employees' VEMR system usage behaviour influences the adoption of the VEMR at Ithembalabantu clinic, the researcher assessed the following predictors:

Q3.1: Have you embraced the VEMR system in your work plan?
Q3.2: Do you intend to continue using the VEMR system in the future?
Q3.3: Do you expect using the VEMR system in the future?

The aim of these predictors is to understand the behaviour intentions of the employees' influence on their use of the VEMR system at Ithembalabantu clinic as illustrated in Fishbein and Ajzen's Theory of Reasoned Action (Fishbein & Ajzen, 1975). The participants' responses to each sub-question are transcribed and analysed below.

4.3.3.1. Have you embraced the VEMR system in your work plan?

The objective of this sub-question was to understand if the employees at Ithembalabantu clinic have already embraced the VEMR system in their work plan. An understanding of the respondents' enthusiastic acceptance and inclusion of the VEMR system in their work plan aids in the explanation of the relationship between their usage behaviour and the actual adoption of the system. Table 4.12 illustrates participants' responses from each department.

Table 4.12: Participants embraced the VEMR in their work plan

Department	Respondents	Response
Pharmacy	4	Did not answer
		Yes, I have. For the clinicians VEMR is a good system so I think it makes life easy for them
		Stopped
		I stopped using it
Medical	2	No, I tried to, but the system gives problems. Couldn't log on at times
		Yes, I use it daily

Table 4.12: <u>Participants embraced the VEMR in their work plan (continued)</u>

Department	Respondents	Response
Monitoring and Evaluation	8	Not really
		Yes, but not regularly
		I could love to work with VEMR system
		Yes, I can foresee it working better for me
		No because I have not used it that much
		-
		-
		No, we have adopted Tier.Net over VEMR
Research	3	Yes, as it is one of the systems that I use to verify patient info along with NHLS and Tier.Net
		No, I use a separate research database
		No, VEMR was stopped in our research department
Patient Administration	6	Yes
		Yes
		Yes, daily
		Yes, because it is easy to find the file if you just punch the ID number
		Yes, VEMR was my daily tool to use
		Yes, and addressed well into the superior management
Laboratory	3	Not yet
		Yes
		No, we mostly use the NHLS system
Nursing	3	Not really
		Yes
		No, I was never trained
Psychosocial	1	No, my computer was stolen

10 % of the participants did not provide their responses on this question. However, the findings of the study revealed that, approximately 44% of the respondents had embraced the VEMR system in their work plan. All the respondents (100%) from the patient administration department indicated that they had embraced the VEMR system in their daily work because it

helped them to easily find the files if they just punch the identity number of the patient in the system.

There were about 14% of the respondents who said that they were rarely using the VEMR system. They only used it when they needed to cross check patients' information. Approximately 42% of the respondents indicated that they had stopped using the VEMR system in their work. They indicated that they discontinued the VEMR and reversed back to their old paper-based system, while 80% had embraced alternative systems like Tier.Net, NHLS and other research databases. 15% of the respondents said that they did not embrace the VEMR system because of the lack of technical support of the system and 5% indicated that their computers were stolen from their department and were never replaced.

4.3.3.2. Do you intend to continue using the VEMR system in the future?

The aim of this sub-question was to understand if the employees at Ithembalabantu clinic intend to continue using the VEMR system in the future. An understanding of the employees' feelings and views of the VEMR system based on their use intentions is crucial in the understanding of the influences that healthcare workers' usage behaviours have on their adoption of the system. Table 4.13 below illustrates participants' responses from each department.

Table 4.13: Participants intent to continue using the VEMR system in the future

Department	Respondents	Response
Pharmacy	4	No manual files work better than VEMR at the moment
		Yes, because of its benefits, it is paperless hence does not lose any information and it reduces patient movement.
		No
		Maybe
Medical	2	Yes, I do intend to do so
		No, informatively all users trained need to be implementing the system

Table 4.13: <u>Participants intent to continue using the VEMR system in the future (continued)</u>

Department	Respondents	Response
Monitoring and Evaluation	8	Maybe
		Yes, only when I need information for report compilation
		Yes, because it will make things very easy and faster
		Not yet using it
		Yes, because of the workload we had in our clinic
		Yes, it is good for both patients and workers
		Yes
		Yes, to follow-up on patient information from other services
Research	3	Yes, when it is fixed
		Not sure
		Yes
Patient Administration	6	Yes, but need to be installed in the filing room
		Yes
		Yes
		Yes, because it makes the filing system more easy
		No, I am no longer working as a clerk
		I do, this is the best technical asset to be in place
Laboratory	3	Yes, it is convenient for everyone
		Yes
		Yes
Nursing	3	Yes, I do intend to continue using the VEMR
		Yes
		Yes, if I receive proper training
Psychosocial	1	No computer

It was found out that about 70% of the respondents intended to continue using the VEMR system in the future. 90% of these respondents indicated that it helps them to easily compile

their reports, it is easy and fast to use, reduces the workload and makes it easy for them to follow-up on patient information from other services.

However, approximately 30% of the respondents reported that they did not intend to continue using the VEMR system in the future and that they believed that the paper based system was working better for them as compared to the VEMR system. Regarding this, those respondents recommended continual system updates and the use of the VEMR system by all the employees who were trained for a successful implementation at the clinic.

About 37 % of the respondents could not elaborate on their responses. This proportion was again identified to be high to validate the responses but does not have any impact on the statistical aspect of the results. Narrative 4.9 below provides verbatim responses from the interviews to substantiate the above discussion.

Narrative 4.9. Participants intending to continue using the VEMR system in the future

> *"Yes, will definitely continue to use this system because of its benefits of being paperless based, the VEMR provides a safe keeping of information and it reduces patient movement. That is enough motivation for me to continually use the system."*
> *"Yes, the system is so perfect because it makes the filing system easier. I will always use it unless if we maybe get another system that is more advanced than it."*
> **Interviews with healthcare workers at Ithembalabantu clinic: 14/07/2018.**

4.3.3.3. Do you expect using the VEMR system in the future?

The aim of this sub-question was to understand if the employees at Ithembalabantu clinic expect using the VEMR system in the future. An exploration of healthcare workers' anticipations based on the current usage behaviour is significant in the understanding of the nexus between usage behaviour and the adoption of the VEMR system. Table 4.14 illustrates participants' responses from each department.

Table 4.14: Participants expect to use the VEMR system in the future

Department	Respondents	Response
Pharmacy	4	No, an easier system should be procured
		Yes, to save time for the patients and to minimise workload for the clinicians
		Maybe
		Maybe
Medical	2	Yes, I do
		Yes, when all the staff members are trained and are using it
Monitoring and Evaluation	8	Maybe
		Maybe
		Yes, because it's the new system introduced
		Yes, I can foresee it working better for me
		Yes
		Yes
		Yes
		Yes
Research	3	Yes, as I am willing to grow in the health sector
		I think so
		Yes
Patient Administration	6	Yes
		Yes
		Yes
		Yes, because it makes work easier and safer and to keep the records of our patients
		Maybe, if I will ever go back to work in the admin
		Yes
Laboratory	3	Yes, it makes my work easier
		Yes
		Yes

Table 4.14: <u>Participants expect to use the VEMR system in the future (continued)</u>

Department	Respondents	Response
Nursing	3	Yes, as it saves time
		Yes
		Not sure
Psychosocial	1	Yes, if implemented in my department

Approximately 73% of the respondents indicated that they anticipated using the VEMR system in the future as it would save them much time and would make their work easier. 80% of the respondents who indicated that they expected using the VEMR system in the future also reported their willingness to learn more about the system.

27% of the respondents however reported that they were not sure if they would be required to use the VEMR system in the future and 10% of the respondents recommended the clinic to adopt another easy-to-use system for the pharmacy.

About 63 % of respondents did not elaborate on their responses. As noted earlier, 73% of the respondents confirmed their expectancy while 27% were uncertain and expected the management of the clinic to decide on their future regarding the VEMR system use. Narrative 4.10 below provides few additional quotes that accrued from the interviews to corroborate the discussed research findings.

Narrative 4.10. Participants' expectations of the VEMR system use in the future

> *"Yes, I look forward to that because it makes our work easier as it ensures a safer keeping of the patients' records."*
>
> *"Yes, I really expect to use the system, it saves time for the patients and it minimizes the workload for the clinicians."*
>
> *"Yes, I really expect its use but when all the staff members are trained and are using it."*
>
> *"Of course, I do but I don't know, the management should just decide for us."*
>
> **Interviews with healthcare workers at Ithembalabantu clinic: 20/07/2018.**

4.3.4. Employees' actual behaviour towards the adoption of the VEMR System

To understand the employees' actual behaviour and what informs the use of the VEMR system at Ithembalabantu clinic, the researcher explored the following predictors:

Q4.1: Are you satisfied with the usage of the VEMR system in work?

Q4.2: Would you recommend the use of the VEMR system to other healthcare facilities?

Q4.3: Do you have positive things to say about the adoption of the VEMR system at your workplace?

Q4.4: Do you have negative things to say about the adoption of the VEMR system at your workplace?

The aim of these predictors was to understand the actual behaviour of the employees at Ithembalabantu clinic towards the adoption of the VEMR system as was illustrated in Fishbein and Ajzen's Theory of Reasoned Action (Fishbein & Ajzen, 1975). The participants' responses of each sub question are transcribed and analysed below.

4.3.4.1. Are you satisfied with the usage of the VEMR system in your work?

The objective of this sub-question was to understand if the employees at Ithembalabantu clinic were satisfied with the usage of the VEMR system in their work. An understanding of the employees' level of satisfaction is important in the understanding of healthcare workers' actual behaviour towards the adoption of the VEMR system. Table 4.15 illustrates the participants' responses from each department.

Table 4.15: Participants are satisfied with the use of the VEMR system in their work

Department	Respondents	Response
Pharmacy	4	No, it is not being used
		Yes, I am because it puts everything in one source and the information is safe
		Stopped using it
		Not totally, stopped using it
Medical	2	No, no clinician uses the system currently.
		Yes, appropriate tool

Table 4.15: <u>Participants are satisfied with the use of the VEMR system in their work (continued)</u>

Department	Respondents	Response
Monitoring and Evaluation	8	Yes
		Not really because at times there is incomplete information
		Yes, I am satisfied unless if there is a new version of it
		Yes, work runs smoothly with the easy sharing of patient medical records
		Yes, it makes it easy to see the number of patients that we had in our facility
		Yes
		Yes, it makes our work easy in terms of tracing patients because all the information is there
		No, we use VEMR as an alternative system
Research	3	No, no one maintains the system. It's been down for months now
		No, most staff are not well trained on using it
		Yes, although we are no longer using it in our department
Patient Administration	6	Yes
		Yes, but have some problems
		Yes
		Yes
		Yes, it was easy to create patient files using the VEMR
		Yes, no more waiting time needed to get information from the old system we dealt with before
Laboratory	3	Yes, because never had complains
		Yes
		No, it's not everyone who is using the VEMR system

Table 4.15: <u>Participants are satisfied with the use of the VEMR system in their work (continued)</u>

Department	Respondents	Response
Nursing	3	Not totally as it is not fully used
		Yes
		No, VEMR does not give me accurate reports
Psychosocial	1	No, the VEMR is not currently installed in my department

The findings revealed that 60 % of the respondents are satisfied with the usage of the VEMR system in their work. Those respondents revealed that they were satisfied with the system as it stores patient data in one source and the information is safe, easily accessible and it was easy to create patient files using the VEMR system. The system works smoothly with the easy sharing of patient medical data and it makes their work easy in terms of tracing patient. 60% of the respondents further indicated that it was easy to check the number of patients that they had in their facility for a specific period. 20% of the respondents also confirmed that they were content with the usage of the VEMR system although they were no longer using it due to lack of support and hence had adopted the use of alternative systems.

It was also found out that about 30% of the respondents were not satisfied with the usage of the VEMR system in their work as it was not user friendly for them. They also revealed that most staff members were not well trained to use the system. The system was down for months and no one maintained it. 10% indicated having some technical problems with the system which needed to be updated on their computers to allow easy use.

4.3.4.2. Would you recommend the use of VEMR system to other healthcare facilities?

The objective of this sub-question was to find out if the employees at Ithembalabantu clinic would recommend the use of the VEMR system to other healthcare facilities. This sub-question was essential in exploring the respondents' views regarding the necessity of the system as well as their acceptance and rejection of the system which aids in the understanding of their overall behaviour towards the system use. Table 4.16 illustrates participants' responses from each department.

Table 4.16: Participants recommend other facilities to use the VEMR system

Department	Respondents	Response
Pharmacy	4	No, it is time consuming and inconvenient
		Yes, I would since we are a private clinic, VEMR has played a pivotal role in the workplace so I would recommend it to the public sector
		Yes, but only if they can change the system and make it easy to understand
		Yes
Medical	2	Yes
		Yes, VEMR is an appropriate tool
Monitoring and Evaluation	8	Yes, to support their services and patient information
		Yes, if all information is being compiled correctly and if it is complete
		Yes, I would recommend other facilities to make things easier for them on their daily basis
		Yes, for efficiency
		Yes, because some healthcare facilities still use paper-based systems
		Yes, to avoid conflict between the workers and the patients when their information is missing due to missing registers
		Yes, it saves time, and it makes everything easy
		Yes, it can help the facility to better manage their patients
Research	3	Not necessarily as I do not fully understand its functions
		Yes
		Yes
Patient Administration	6	Not exactly, it depends on their purpose
		Yes
		Yes, it is time saving
		Yes

Table 4.16: Participants recommend other facilities to use the VEMR system (continued)

Department	Respondents	Response
		Yes, to register their patients
		Yes, this could be a major role to assist them in their facilities as well
Laboratory	3	Yes, because their benefits for their facility
		Yes
		Yes, it easily shares patient information which is easily accessible across the facility
Nursing	3	Yes, depending on the need of each facility
		Yes
		Yes
Psychosocial	1	Yes

Most respondents (90%) indicated that they would recommend the use of the VEMR system to other healthcare facilities as this would play a major role in assisting and supporting their services as well as in the management of their patients' information. Indicated benefits of the system included making everything easier and the safe storage of participants' information. They said the system could benefit other facilities as it made it easy to share patients' information which could be easily accessible across the facility.

50% of the respondents indicated that they would recommend the use of the VEMR system depending on the need of each facility. It was reported to be necessary for the facility to fully understand the system's functions for the correct capturing of patients' information. However, 10% of the respondents complained that the VEMR system was time consuming and inconvenient and therefore reported that they would therefore not recommend it to other healthcare facilities.

About 37 % of the participants did not elaborate on their responses as they generally believed that the VEMR was an important tool for recording patients' information and therefore believed that every healthcare facility should adopt such a tool to keep their patients' information safe and easily accessible. Narrative 4.11 below provides some verbatim responses from selected respondents to validate the discussed findings.

Narrative 4.11. Participants recommending other facilities to use the VEMR system

> *"Yes, all facilities must adopt the system to avoid conflict between the workers and the patients when their paper-based file is lost or misplaced."*
>
> *"Yes, facilities need to utilise the VEMR system for the better management of their patients."*
>
> *"Yes, I would recommend the VEMR system since we are a private clinic; VEMR has played a pivotal role in our workplace. So, I would recommend it to the public sector."*
>
> **Interviews with healthcare professionals from Ithembalabantu clinic: 25/07/2018**

4.3.4.3. Do you have positive things to say about the adoption of the VEMR system at your workplace?

The objective of this sub-question was to find out the positive things from the employees at Ithembalabantu clinic about the adoption of the VEMR system at their work. Positive sentiments from the healthcare workers regarding the VEMR system use enabled the understanding of their level of tolerance of the system as well as their views on the necessity of the system which gives a picture of their complete behaviour towards the system use. Table 4.17 illustrates participants' responses from each department.

Table 4.17: Participants have positive feedback about the adoption of the VEMR system

Department	Respondents	Response
Pharmacy	4	It helps to store patient information for easy access if the file is lost
		Yes, I do with reference to the clinicians and how it has helped them
		Finding patient information, knowing which regimen the patient is on
		It will save time and ensure an easy access to patient files

Table 4.17: <u>Participants have positive feedback about the adoption of the VEMR system (continued)</u>

Department	Respondents	Response
Medical	2	Advantageous for updating patient information records
		Yes, it is useful to work with the system
Monitoring and Evaluation	8	It helps for patient follow-ups as it makes it easy to retrieve information
		Yes, when used appropriately it can make work easier
		We are having a great opportunity to know and work with the VEMR system
		Yes, it makes it easy to compile reports and is more accurate
		It can eliminate paper-based systems and make it easy to find patient information
		Yes, VEMR is good and safer
		VEMR helps to store and retrieve patient information easily, making it available for all.
		VEMR can be a good system if used effectively and integrated with other existing systems at the facility
Research	3	Yes, with this system, patients information can be stored safely and securely
		If effectively used, it helps in patient treatment management and picking up defaulters
		It helps to trace patient information easily
Patient Administration	6	Check in patient, track results, file patient information
		Easy to track patients, easy to retrieve information, safe information than papers
		Its time saving, can track appointments
		Yes, because it makes our work easier and it saves time, easy to find patients' file numbers

Table 4.17: Participants have positive feedback about the adoption of the VEMR system (continued)

Department	Respondents	Response
		With VEMR, it is easy to access and edit patients' files. VEMR saves time
		Tracking records, and registering of patients
Laboratory	3	Yes, for the benefits of the patient
		Makes my work easy and ensures an easy access of patient information
		It helps to save and retrieve patient results and share information across the clinic
Nursing	3	Easy patient information recording, retrieving and storage
		Easy access to information
		I can easily trace patients and retrieve files. I can also check staff performance
Psychosocial	1	VEMR saves time, easy access to files, easy follow-up and report generation

All respondents (100%) said some positive things about their experience on the adoption of the VEMR system at their workplace.

Friendliness of the VEMR system:

80% of the respondents indicated that they easily recorded, retrieved and stored patient information using the VEMR system. They could easily trace patients and retrieve their files. 90% of the respondents revealed that the VEMR system made their work easier and it saved their time. It was easy to find patient file numbers and they could easily update patients' information. They further indicated that it made it easy for them to compile accurate reports and check staff performance.

Data storage and accessibility:

All respondents (100%) indicated that the VEMR system helped them to safely store patients' information for easy access in cases where hard copies were lost. Patient information was shared and easily accessible across the clinic. With the system, patients' information is safely stored and secured.

Patient care management:

Most respondents said that the VEMR system helped them to check in patients, track their appointments and to retrieve their medical history.

Narrative 4.12. Participants' positive feedback about the adoption of the VEMR system

> *"The VEMR makes it easy to track patients, easy to retrieve information and it is safe to archive information than papers."*
>
> *"I do from the response of the clinicians and how it has helped them finding patient information, knowing which regimen is the patient on. It helps to do patient assessments and follow-ups."*
>
> *"It can eliminate paper-based systems and make it easy to find patient information"*
>
> *"VEMR can be a good system if used effectively and integrated with other existing system at the facility"*
>
> *"If effectively used, it helps in patient treatment management and picking up defaulters."*
>
> **Interviews with healthcare professionals from Ithembalabantu clinic: 26/07/2018**

4.3.4.4. Do you have negative things to say about the adoption of the VEMR system at your workplace?

The objective of this sub-question was to find out the negative things from the employees at Ithembalabantu clinic about the adoption of the VEMR system at their work. Negative responses from healthcare workers about the VEMR system use ensure an understanding of their level of rejection of the system as well as their views on the challenges of the system which gives a clear picture of their complete behaviour towards the system use. Table 4.18 illustrates participants' responses from each department.

Table 4.18: Participants have negative feedback about the adoption of the VEMR system

Department	Respondents	Response
Pharmacy	4	It has too many steps and it requires too much effort and employees' time
		Yes, when we don't have electricity, the computers are down. The clinicians tend to struggle because they have to use paper-based patient files
		Time consuming
		No
Medical	2	I do not think most clinicians received adequate training; therefore, they shy away from the system
		No
Monitoring and Evaluation	8	No
		Yes, it cannot be relied on exclusively
		If I am not trained, maybe I would have difficulties in operating the VEMR
		No
		Yes, it needs to be upgraded to include TB patients
		No
		Yes, sometimes it refuses to do some needed reports
		Needs to be integrated with Tier.Net
Research	3	Not about VEMR but the way that it has been neglected at my clinic
		No
		No
Patient Administration	6	It should meet the purpose of the filing room
		The VEMR sometimes does not give access to the patient if another resource is using the file, not all departments are using it, therefore can't get full information about the
		If freezing sometimes, errors and limited support
		No

Table 4.18: <u>Participants have negative feedback about the adoption of the VEMR system (continued)</u>

Department	Respondents	Response
		When the network is down or the electricity is off, VEMR cannot be used.
		Yes, sometimes due to late update of the system
Laboratory	3	No because it never has problems
		Not all patients are captured
		Need to update the system and provide more training
Nursing	3	Limited support and internet connectivity failure
		when its offline we cannot do our work
		No accurate reports
Psychosocial	1	Not at the moment

There were about 70% of the respondents who shared their negative experiences on the adoption of the VEMR system. 50% of these respondents said the VEMR system could not be relied on exclusively as it sometimes freezes, gave errors and they complained about the lack of training, support and maintenance of the system. 10% of the respondents said they did not get accurate reports from the system. Network connectivity and power failure were also indicated as limitations to access the VEMR systems. 5% of the respondents further indicated that the system had so many steps that it required too much effort and their time to perform the work.

Narrative 4.13. Participants' negative feedback about the adoption of the VEMR system

> *"The VEMR sometimes does not give access to the patient if another resource is using the file, not all departments are using it, therefore can't get full information about the patient."*
>
> *"It needs to be upgraded because there is no module for TB patients."*
>
> *"When we don't have network or electricity, the computers are down. The clinicians tend to struggle because they have to go back to paper based patient files."*
>
> *"The VEMR system is not integrated with other systems at the facility."*
>
> **Interviews with healthcare professionals from Ithembalabantu clinic: 23/07/2018.**

4.4. Observation

As discussed in chapter 3, observations were undertaken to explore the effects of the VEMR system and to understand how and at which level the VEMR system was being used. The observation was guided by the following questions:

1. Does the employee fully use the VEMR system?
2. Does the employee use the VEMR system to enhance patient care?
3. Does the employee use the VEMR system to enhance their professional satisfaction?
4. Does the employee use the VEMR system and consider it as a resource across the facilities?

4.4.1. Does the employee fully use the VEMR system?

Direct observations were undertaken to explore if the respondents were fully using the VEMR system. The findings from the observation revealed that only 60% of the respondents were actually using the VEMR system constantly. 20% of the total numbers of respondents were using the VEMR system occasionally, mainly checking for a specific patient file for history or results. 20% of respondents were no longer using the system. It was found out that in the Monitoring and Evaluation department they had adopted the use of the Tier.Net system for their patients' information management and the pharmacy had reversed back to using paper-based system. As shall be noted in chapter 5, recommendations were made based on this observation for the department to invest in training and awareness campaigns to ensure an efficient use of the VEMR system in their department. The direct observations also revealed that only 30% of the respondents were using the VEMR system at its full capacity. These participants were mainly from medical and nursing departments as they were required to look at each patient file holistically to record or review the patient demographic and history. However, 70% of the participants were using specific modules related to their assigned work, their access to other VEMR system modules was restricted by the VEMR system administrator to protect unauthorized access to patients' information.

4.4.2. Does the employee use the VEMR system to enhance patient care?

The researcher conducted direct observations to determine if the participants were using the VEMR system to enhance their patient care. The observation focused on looking on the information that was being captured into the VEMR system. About 67% of the respondents

were found using the VEMR system to enhance their patient care. There were about 7% who were observed occasionally using the system to enhance patient care. Approximately 26% of the respondents did not use the VEMR system to enhance patient care; these included all participants from the pharmacy department.

4.4.3. Does the employee use the VEMR system to enhance their professional satisfaction?

The aim of conducting this observation was to determine if the participants were using the VEMR system to enhance their professional satisfaction. Both direct and indirect observations were conducted to check how participants were motivated to use the VEMR system. Both direct and indirect observations revealed that participants from medical, patient administration, monitoring and Evaluation departments were using the VEMR system to enhance their own professional satisfaction and were passionate to learn more. The findings from these observations further revealed that about 57% of the respondents were using the VEMR system to improve their work performance.

4.4.4. Does the employee use the VEMR system and consider it as a resource across the facilities?

The objective of this observation was to find out if the participants were using the VEMR system and considered it to be a resource across the entire facility. The focus was on sharing information using the VEMR system with other resources. Using both direct and indict observations, it was revealed that 70% of the respondents were using the VEMR system and considered it to be a resource across the entire facility. The majority of these were participants from the medical, nursing and patient administration departments.

4.5. Summary

This chapter focused on the presentation and analysis of data related to the questions from the interview schedules and observations. A qualitative study was presented in a narrative technique to present the findings of the study. All predictors demonstrated to be reliable to the model to determine the employee' actual behaviour towards the use of the VEMR system at Ithembalabantu clinic. About 80% of the respondents perceived the VEMR system as an appropriate tool for health workers to use. Identified benefits include minimizing time,

convenience, enabling an easy and safe storage of information as well as ensuring an easy identification and recovery of the required information. 4% of the respondents however felt that the system was time consuming and inconvenient hence perceived it as an inappropriate tool especially for the pharmacy department. About 80% of the respondents liked the purpose of using the VEMR system and were interested in using it over paper based systems as it made their jobs easier and was useful for their patient care and management especially the capturing, retrieving and updating of patients' information. However, about 10% of the respondents had a negative attitude towards the use of the VEMR system. They revealed their lack of interest in the system which they found to be useless and inappropriate. They opted for paper-based systems as they perceived the VEMR system to be time consuming and inconvenient. With regards to employees' subjective norms towards the use of the VEMR system, the study findings revealed that approximately 70% of the respondents were trained to use the system and were willing to put every effort to adopt the system as was recommended and motivated by their management, colleagues and personal feelings. However, about 20% of the respondents revealed their lack of awareness and willingness to adopt the system. About 80% of the respondents embraced the system in their work plan and expected and intended to continually use the system. However, about 42% of the respondents revealed that they had stopped using the system which is most likely due to the challenges that they noted in the system including lack of awareness, technical support and computers. Regarding the actual behaviour of the employees towards the adoption of the VEMR system, about 80% of the respondents revealed that they were satisfied with the system and would recommend it to other healthcare facilities. About 20% of the respondents however depicted a low level of satisfaction and uttered negative sentiments regarding the adoption of the VEMR system. The data presented in this chapter will be discussed deeper in the next chapter (chapter 5).

CHAPTER 5

FINDINGS, DISCUSSIONS AND RECOMMENDATIONS

5.1. Introduction

Centered on the argument that the attitude and behaviour of employees towards the use of the VEMR system influences the adoption of the system, this study was conducted to explore the attitude and behaviour of healthcare workers towards the use of the VEMR systems at Ithembalabantu clinic in Durban. A reflection of these changing aspects was important for influencing health information systems strategy and assisting healthcare facilities in the decision-making processes towards the adoption and usage of the VEMR system, which would ultimately lead to improved employees' performance and health care services. The board of literature on eHealth systems particularly in Africa has been widespread and thorough on the intentions, determinants and impacts of adopting the system (Botha, 2015; Kalam; 2011) yet it is not comprehensive and incomplete on varied central quandaries within the eHealth discourse given that the adoption and implementation of such systems is problematic. In this context, this study sought to address the main research question: What is the attitude and behaviour of healthcare workers towards the use of the VEMR system at Ithembalabantu clinic in Durban? The objectives of this question were to first explore the employees' individual attitude towards the use of the VEMR system at Ithembalabantu clinic; second, to explore how the employees' intention to use the VEMR system influenced the adoption of VEMR system at Ithembalabantu clinic; third, to understand what informed the use of the VEMR system at Ithembalabantu clinic, and finally, to understand how the employees' VEMR system usage behaviour influenced the adoption of the VEMR systems at Ithembalabantu clinic in Durban. For the objectives of this study to be achieved, a qualitative research approach was used where interview schedules and observations were used as data collection instruments. The relationships consequent from the above-mentioned objectives conceptualized and tested the Fishbein and Ajzen's Theory of Reasoned Action (1975). This chapter discusses the results of the study that are presented in chapter four in relation to the literature from which the hypothesis of this study was derived. The research findings are synthesized within the Theory of Reasoned Action as a conceptual framework that guided this study. Theoretical and strategy implications of the study are clearly discussed followed by an general summary of the study.

5.2. Discussion of research questions

The use variable was explored by asking participants when they first started using the VEMR system, asking and observing if they were using more of the VEMR features, using VEMR more often or if they used it for more of their work tasks. This assisted to understand the actual attitude and behaviour of the respondents in the usage of the VEMR system. In relation to Fishbein and Ajzen's Theory of Reasoned Action (1975), it was argued that the actual behaviour was influenced by the attitude, subjective norms and intention to use the system.

5.2.1. Individual attitude towards the use of the VEMR system

The attitude of healthcare workers plays an imperative role in the adoption of the VEMR system at Ithembalabantu clinic. As presented in chapter 4, it is evident from the findings that most of the participants were positive about the use of the VEMR system based on the value it brought to their patient information flow. The interpretation of the findings in chapter 4 of this study shows that some resistance factors were identified, and these were attributed to the lack of involvement of other departments, poor senior management involvement and the VEMR system support provided at the Ithembalabantu clinic. There were also some complaints from Ithembalabantu employees who were not interested in the use of the VEMR system.

Research question 1: "*What is the individual employee's attitude towards the use of the VEMR system at Ithembalabantu clinic?"* is answered as follows:

Q1.1: VEMR system as an appropriate tool: The findings from section 4.3.1.1 of chapter 4 shows that there exists an influence between the individual employee attitude towards the use of the VEMR and the VEMR system being an appropriate tool to use for healthcare workers. Although about 80% of the respondents believed that the VEMR system was an appropriate tool for healthcare workers, there were some negativity established towards the adoption of the VEMR system in some departments where the system did not meet their needs. It was point out that the system was not giving them the ability to perform their work easily and therefore they perceived it to be time consuming and inappropriate.

Q1.2: Purpose of using the VEMR system: The findings from section 4.3.1.2 of chapter 4 confirms that there exists an influence between the individual employee attitude towards the use of the VEMR and the purpose of using the VEMR system. All respondents (100%) were positive about the purpose of adopting the VEMR system in their work. However, approximately 10% of the respondents recommended that proper training and support should be provided to motivate their intention of using the system. An influence exists between individual employees' attitudes towards the use of the VEMR and the purpose of using the VEMR system.

Q1.3: Usefulness of the VEMR system: The findings from section 4.3.1.3 of chapter 4 shows that there exists an influence between the individual employee's attitude towards the use of the VEMR and the purpose of usefulness of the VEMR system. The usefulness of the system was supported by approximately 90% of the respondents, though there were significant recommendations on the importance of capturing and updating patients' information and the involvement of all the departments within the clinic.

Q1.4: Interest in the use the VEMR system: The findings from section 4.3.1.4 of chapter 4 shows that there exists an influence between the individual employees' attitudes towards the use of the VEMR and their interest in the use of the VEMR system. About 80% of the respondents who participated in the study affirmed having interest in the use the VEMR system. However, the findings revealed some challenges from selected departments such as the pharmacy sector, where participants lost their interest in the use of the system to avoid the duplication of their work as they had adopted other systems for their daily work.

Q1.5: Preference of the VEMR over paper-based system: The findings from section 4.3.1.1 of chapter 4 shows that there exists an influence between the individual employees' attitudes towards the use of the VEMR system and their preference of using the VEMR over paper-based systems. 95% of the employees who participated in this study affirmed that they preferred using an electronic system over papers. The discrepancy, inaccuracy, illegibility, inaccessibility, and insecurity of paper-based systems were some of the limitations indicated in the findings.

The above attributes support the findings of Huryk (2010) regarding healthcare workers' attitudes towards an eHealth system use. The first objective of this study "*Explore the*

employee's individual attitude toward the use of the VEMR system at Ithembalabantu clinic in Umlazi, Durban" was then attended by these attributes.

5.2.2. Factors influencing the adoption of the VEMR system

The findings of this research revealed that most of the participants were influenced by various factors to use the VEMR system.

Research question 2: "*How do the employees' intentions to use the VEMR system influence the adoption of the VEMR at Ithembalabantu clinic?*" is answered in the following discussions. The following subjective norms supported the characteristics that influence the adoption of the VEMR system at Ithembalabantu clinic.

Q2.1: Management recommendation: The findings from section 4.3.2.1 of chapter 4 confirms that there exists an influence between the employees' intentions to use the VEMR system and the recommendations by management for employees to use the system. The findings of this research revealed that respondents from patient administration as well as monitoring and evaluation departments were recommended to use the VEMR system as part of their job description. The system was however adopted in other departments even though there was less support from the management. Management was visibly involved in supporting employees in operational challenges that could be experienced and to further device means to promote and improve operational efficiencies in the VEMR system adoption.

Q2.2: Feeling of responsibility toward patients: The findings from section 4.3.2.2 of chapter 4 confirms that there exists an influence between the employees' intentions to use the VEMR system and their feeling of responsibility toward patients care. Although 76% of the respondents were moved by their feelings of responsibility toward their patients, participants from the medical and pharmacy departments argued that their responsibility towards their patients was important regardless of the VEMR system.

Q2.3: Views from colleagues: The findings from section 4.3.2.3 of chapter 4 confirms that there exist an influence exists between the employees' intention to use the VEMR system and the views from their colleagues to use the system. Though training and support were indicated as the key challenges by the participants, lack of involvement of other departments in the process played a significant role in the resistance and instigated the negative attitude

towards the VEMR system at Ithembalabantu. The colleagues can play a greater role in promoting further awareness on the VEMR system. All stakeholders within the institutional structure should be involved in the use of the VEMR system for continuity of care and the successful adoption.

Q2.4: Training: The findings from section 4.3.2.4 of chapter 4 confirms that there exists an influence between the employees' intention to use the VEMR system and the training received to use the system. 64% of the respondents received training on the VEMR system and 15% learnt from colleagues. The lack of readily available material to guide those new to the VEMR system was found as a challenge in this regard. Ongoing training and facility workshops are required to mitigate the resistance of the adoption of the VEMR system. This could potentially improve the use of the system.

Q2.5: Effort toward continuity of use: The findings from section 4.3.2.5 of chapter 4 confirms that there exists an influence An influence exists between the employees' intention to use the VEMR system and their efforts towards the continual use of the system. Findings suggested that technical support should be provided to keep the VEMR system updated and more user friendly.

The above five attributes support the findings of Seok Kim, Kee-Hyuck Lee, Hee Hwang and Sooyoung (2016) in their study on the factors that influence users' intentions to utilize electronic health records systems. The second objective of this study "*To explore how the employees' intentions to use the VEMR system influence the adoption of the VEMR system at Ithembalabantu clinic in Umlazi, Durban"* was attended by these attributes.

5.2.3. Intention to use the VEMR system

Research question 3: "*How does the employees' VEMR system usage behaviour influence the adoption of the VEMR at Ithembalabantu clinic?*" was answered as follows:

As revealed in the findings of this study, approximately 44% of the respondents had not embraced the use of the VEMR system in their work plans. The patient administration department is the only department that had fully embraced the VEMR system in their services. About 42% of the respondents reverted back to the use of paper-based systems and other electronic systems, like Tier.Net, that best worked for them.

A high consideration of using the VEMR system to share patients' information across the facility was observed in section 4.4.1 of chapter 4, from the medical patient administration, monitoring and evaluation departments where respondents also believed it was enhancing their patients care as well as their professional satisfaction. It was also observed in section 4.4.2 of chapter 4, that almost half of the respondents were embracing the VEMR system in their work plan. The use of the system in search of files to cross check patients' information was observed. However, about 42% of the respondents rejected the system as they continually utilized paper-based systems (section 4.4.3 of chapter 4). The lack of technical infrastructure was observed to be the major bottleneck in this regard.

The findings revealed that the impact and satisfaction of the VEMR system on service delivery has an influence on employees' intention to continue using the system in the future. This is consistent with the response of Bhattacherjee (2001) who found that perceived usefulness had an influence on continuance intention.

A high expectancy from 73% of the respondents was also revealed from the findings, though 27% of the respondents were uncertain on the future of the VEMR system at Ithembalabantu clinic. 10% showed some negativity in the adoption of the VEMR system.

There was an influence between the employees' intention behaviour to use the VEMR system and the intention to continue using the VEMR system and expectation of using the VEMR in the future. These attributes support the findings of Govindaraju et al., (2017) who demonstrated the abilities, motivations and opportunities that influenced healthcare employees' electronic heath system adoption behaviour. The third objective of this study "*To understand how the employees' VEMR system usage behaviour influences the adoption of the VEMR at Ithembalabantu clinic in Umlazi, Durban*" was attended.

5.2.4. Actual behaviour towards the adoption of the VEMR system

Research question 4: "*Why do Ithembalabantu employees use the VEMR system?"* was answered as follows:

While no influence was found between use (measured as increasing levels of use) and job satisfaction, the results reveal that the respondents were further satisfied with their jobs than non-users. These findings reveal that an increase in the use of the VEMR system does not

lead to more job satisfaction but rather it was usage at any level that positively affected job satisfaction.

The observation revealed that there was a significant gap in the daily usage of the VEMR system whereby the patient administration was the only department that was perceived to be consistently using the VEMR system. Positivity concerning the VEMR system usage was observed among healthcare workers. 20% of the respondents were seen recommending their colleagues to adopt the system due to its notable benefits of convenience and efficiency. However, about 30% of the respondents showed some dissatisfaction and they constantly discouraged the VEMR system use, citing it as inconvenient and time consuming.

Despite 90% of the respondents affirming that they would recommend the adoption of the VEMR system to other healthcare facilities, the results emphasised the necessity of each facility to fully understand the functionalities of the VEMR system before adopting it. The findings of this study reported data storage and accessibility to be the key perceived benefits of the VEMR system at Ithembalabantu clinic. Respondents from the patient administration department as well as those from the monitoring and evaluation sector also indicated other benefits from the patient care management perspective and the friendliness of the VEMR system.

Though 90% of the participants were positive about the VEMR system and indicated that the VEMR system was pertinent and easy to use, there was however some negativity established by approximately 10% of the respondents which was potentially linked to the training approach and the lack of technical and organisational support of the system at Ithembalabantu clinic.

These attributes support the findings of David et al., (2006) in their study which focused on identifying features of an electronic health system that contributes to user satisfaction. The final objective of this study "*To understand what informs the use of the VEMR system at Ithembalabantu clinic in Umlazi, Durban*" was attended.

5.3. Recommendations

Interaction with respondents revealed that poor policy implementation and the understanding of the standard operating procedures of the VEMR system contributed to the poor adoption and usage of the system. There was consensus among the respondents that the management of the clinic has to motivate and support the usage of the VEMR system in all departments to improve the quality of data being collected. Like any other eHealth systems, the effectiveness of the VEMR system at Ithembalabantu lies on the re-enforcement of the employees professional ethics. To ensure improved VEMR system use for improved healthcare services, this study appeals the following recommendations:

5.3.1. Recommendations to the management

To address the inconvenience of the VEMR system as narrated in sections 4.3.1 of chapter 4, this study recommends that every electronic medical record system has to be developed using a user centered design approach to allow end-users participation in the system design process and to confirm whether or not the system is efficient, useful and how it can be improved. Focus has to be directed on making sure that the VEMR system is updated, maintained, responds quickly in the high-pressured environment of healthcare service delivery, and is trusted to perform as expected when processing user inputs to generate reports.

As illustrated in section 4.3.2.1 of chapter 4, this study suggests the facility management to create an enabling infrastructure, environment and resources to allow appropriate usage of the electronic medical record system and implement formal data management policies to support their data collection processes. It is hoped that service quality improvement will motivate all departments to use the VEMR system.

The findings in section 4.3.2.4 further recommend that institutions have to conduct computer literacy sessions for healthcare workers and provide ongoing VEMR system training and support to increase the efficiency and effectiveness of electronic health system usage. The use of power back-up generators and renewable energy might assist in ensuring the effective continual of healthcare services delivery. The management should also invest in the constant monitoring and evaluation of the VEMR system by keeping an audit track of use to address compliance and all the issues of concern.

5.3.2. Recommendations to the employees

With regards to employees' satisfaction and the limited use of the VEMR system due to insufficient training, the findings in section 4.3.4.1 of chapter 4 recommend the employees to attend both formal and informal computer trainings for an easy implementation of the VEMR system at Ithembalabantu clinic.

The findings in section 4.3.4.2 of chapter 4 of this study also recommend ongoing use of the VEMR system to enable easy and timely access to information and sharing of patient files within the clinic as well as reporting and managing patient clinical information.

The findings of this study further recommend the employees in section 4.3.4.4 of chapter 4 to promptly report to management and vendor the practical concerns and limitations that hider them to use the VEMR system for feature inclusion.

5.3.3. Recommendation for future research

The limitations of this case study create chances for further investigations. Forthcoming studies have to focus on testing the model of this case study in numerous contexts to identify if the contextual alterations affect the findings of this case study. A longitudinal research may also minimize the limitations of this case study and strengthen its internal validity and further substantiate the research finding that the VEMR system usage behaviour leads to improved employees' performance.

Further research is also needed to gauge the perceptions, attitude, and intention behaviours of the employees who are affected by the VEMR system but are not currently using it. There is no research on the relationship between the VEMR system quality and job satisfaction. Given that healthcare facilities that implemented the VEMR system are still using it together with paper-based system, further study is required to explore why facilities find it problematic to go paperless.

5.3.4. Implications for healthcare facilities

This study contributes to the theory by presenting experiential evidence for current theories and support for existing literature. Findings that vary from existing literature were also exposed and are important to note. This study tested the relationship and established the validity of Fishbein and Ajzen's Theory of Reasoned Action (1975). This model assisted to

better explain the actual behaviour of the employees toward the use of the VEMR system which this study conceptualized to be perceived user satisfaction, system benefits and continuance of use.

These benefits from the Theory of Reasoned Action were hypothesized to influence the actual behaviour of the employees and it was shown that the individual behaviour and the subjective norms were imperative to the employees' intention behaviour to use the system. Moreover, the employees' intention behaviours were shown to be important to the actual system usage behaviour. This study has also subsidized to the VEMR context by defining the factors that influence the usage of the VEMR system. The findings showed that the adoption of the VEMR system at Ithembalabantu clinic was related to the user satisfaction and system performance. There was no past literature that was found to examine this relationship and, therefore, this finding adds a new contribution to the body of knowledge.

5.4. Challenges and Limitations of the Study

This research is a case study where data was collected from Ithembalabantu clinic. The data collected was too large for qualitative research and too small for a quantitative study. The findings of the study might therefore not apply to healthcare facilities where different contextual factors exist. While the sample size was large enough to allow for the model to be tested, it makes this study vulnerable to a non-response bias, thus restrictive the external validity of this study. The findings of this study might therefore not be generalisable to employees who did not participate in the study.

By being a qualitative study whereby scheduled interviews and observation were used to collect data, this study is subject to reliability motif, social desirability bias, common method bias and low levels of internal validity. Any causal implications are thus only made in relation to theory. This study was conducted at one clinic in Durban hence might not be generalisable to all employees. However, in line with its aim as a qualitative study, the study proffers in-depth data concerning employees' individual attitudes and behaviours towards the use of the VEMR system. This study was also undertaken within limited time scale and funds which motivated the use of a small sample which might have obstructed on the validity and reliability of the study.

5.5. **Summary**

The aim of strengthening healthcare service delivery is for patients to receive better quality of care. Despite the current progress of implementation of the VEMR system at Ithembalabantu, there is still considerable need to strengthen the adoption and system usage in each department by re-enforcement individual professional ethics to improve routine data management with reference to timeliness, accessibility, accuracy, completeness, and the quality of data collected, and more importantly to consider the concerns and recommendations from the users.

To explore the attitude of healthcare workers towards the use of the VEMR system at Ithembalabantu clinic in Durban, this study presented experiential evidence on current theories and supported existing literature to reveal a model that expose the factors that possibly lead to the employees' actual behaviours. This is useful to healthcare workers as well as managers wanting to advance the moral and incentive of healthcare workers. The actual behaviour is possibly prejudiced by the use of the VEMR system at any level. It therefore imperative that managers consider ensuring that all healthcare workers are given the option and are motivated to use of the VEMR system to carry out their tasks. This may be beneficial to every department at Ithembalabantu clinic and may increase their job performance.

The literature furthermore revealed dissimilarities in usage patterns and perceptions of the adoption and use of the VEMR system at Ithembalabantu clinic. Little was known about user behaviour towards the use of the VEMR system such as individual attitude, subjective norms, intention behaviour and actual usage behaviours. The study recommends decision makers and the VEMR system facilitators to pay attention to system benefits and users' satisfaction to ensure a satisfactory adoption of the VEMR system adoption as these are potential determinants of users' actual behaviours.

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ANNEXURES

Annexure 1: Gate keeper's letter

AHF SOUTH AFRICA

24 October 2017

To Whom It My Concern

Re: **PERMISSION TO CONDUCT RESEARCH AS PART OF THE RESEARCH DISSERTATION REQUIREMENT FOR M.COM. COURSEWORK DEGREE**

This letter serves to grant permission for student **BAHINDWA KALALIZI** , Student No: **210552099** to conduct research at Ithembalabantu Clinic, as part of his research dissertation requirement for M.Com course work degree.

As explained in his request, the topic of the dissertation is, "**Exploring the adoption of the VEMR system at Ithembalabantu clinic in Umlazi".**

Kind Regards,

[redacted]

Ms Hilary Thulare-Ramothwala
Country Program Director – AIDS Healthcare Foundation (SA)

AHF

AIDS Healthcare Foundation South Africa | National Offices
32 Stephen Dlamini Road •Musgrave, Durban•KwaZulu-Natal •South Africa • 4001
Tel. +27-31-202 0016/17 • aidshealth.org

Annexure 2: Research instruments

INFORMED CONSENT DOCUMENT

UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE (HSSREC)

APPLICATION FOR ETHICS APPROVAL

For research with human participants

Date: 27 March 2018

Greetings,

My name is Bahindwa Kalalizi, coursework Master student in the School of Management, Information Technology and Governance at the University of Kwazulu-Natal. May email address is jpm882@gmail.com and my cell number is 0730640119.

You are being invited to consider participating in a study that involves research on exploring the adoption of the VEMR system at Ithembalabantu clinic. The aim and purpose of this research is to explore the VEMR system adoption outcome by:

- Exploring the employee's individual attitude toward the use of the VEMR system at Ithembalabantu clinic;
- Exploring how the employees' intention to use the VEMR system influence the adoption of VEMR system at Ithembalabantu clinic;
- Understanding what informs the use of the VEMR system at Ithembalabantu clinic;
- Understanding how the employees' VEMR system usage behaviour influence the adoption of the VEMR at Ithembalabantu clinic in Umlazi, Durban

The study is expected to purposively select employees who are exposed to the use of the VEMR system from the patient registration department, clinical department, pharmacy department, laboratory department, psychosocial department, and management at

Ithembalabantu clinic. It will involve the following: a total of seventeen (17) semi structured interviews will be conducted with selected employees from those departments to understand why they are using VEMR system as an e-health system or why not. The researcher will aslo observe how the system is being used to understand the effects of the VEMR system and how and wich level it is being used. The duration of your participation if you choose to participate and remain in the study is expected to be two (2) months.

The study will involve no risks and/or discomforts to participants. The study will be more benefit to the management of Ithembalabantu clinic as it will draw out lessons from users' experiences and gives recommendations for similar system adoption in the future.

This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number HSS/0089/018M).

In the event of any problems or concerns/questions you may contact the researcher at 0730640119 / jpm882@gmail.com or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

Mrs Mariette Snyman

Humanities and Social Science Ethics (HSSREC) Research Office,

Govan Mbeki Building, Westville Campus, Private Bag X54001, DURBAN 4000

Tel: 031 260 8350 Snymanm@ukzn.ac.za

Researcher: Name (Telephone number)

Supervisor: Name (Office Telephone number)

Throughout the research process, all interviews conducted will remain strictly confidential. No participant will be asked to provide his/her name or any contact details. Participants will therefore remain anonymous and under no circumstances will their confidentiality be broken in any way. All participation is voluntary, and no participant will be forced to participate in this research and in the event of refusal/withdrawal of participation the participants will not incur penalty or loss of treatment or other benefit to which they are normally entitled.

In accordance with the rules of the University of KwaZulu-Natal, the researcher in consultation with his supervisor will store the data for a period of five years. After this period all confidential or sensitive data will be destroyed and will not be used for further research without the express permission of the interviewees.

If you have any questions or concerns about participating in the study, please contact me or my research supervisor at the numbers listed above.

Thank you very much for agreeing to take part in this research.

_____

Mr. Bahindwa Kalalizi

M.Com Student

School of Management, IT and Governance

CONSENT

I _____ have been informed about the study entitled Exploring the adoption of the VEMR system at Ithembalabantu clinic in Umlazi, Durban by Mr Bahindwa Kalalizi, M.Com student in Information Systems and Technology at the University of KwaZulu-Natal.

I understand the purpose and procedures of the study.

I have been given an opportunity to answer questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits that I usually am entitled to.

I have been informed about any available compensation or medical treatment if injury occurs to me as a result of study-related procedures.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at 0730640119 / jpm882@gmail.com.

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557 - Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

Additional consent, where applicable

I hereby provide consent to audio-record my interview / YES / NO

_____ _____

Signature of Participant **Date**

Interview schedule

A. Demographics	
Which department are you working in?	
What is your position?	
How long have you been working in your current position?	
For how long you have been using the VEMR system?	
B. **Employees' individual attitude towards the adoption of the VEMR system**	
1. Do you think the VEMR system is an appropriate tool for healthcare worker to use? Elaborate	
2. Do you like the purpose of using the VEMR system? Elaborate	
3. Do you find the VEMR system useful for your patient care and management? Elaborate	
4. Are you very interested in the use of the VEMR system? Elaborate	
5. Do you prefer using the VEMR system than paper based? Elaborate	
C. **Employees' subjective norms towards the adoption of the VEMR system**	
6. Does the management of the clinic recommend you should use the VEMR system? Elaborate	
7. Does your feelings of responsibility toward your patients influences you to use the	

VEMR system? Elaborate	
8. Does your colleagues think you should use the VEMR system? Elaborate	
9. Are you already trained to use the VEMR system? Elaborate	
10. Would you put every effort to adopt the usage of the VEMR in your work? Elaborate	
D. **Employees' intention to use the VEMR System**	
11. Have you embraced the VEMR system in your work plan? Elaborate	
12. Do you intend to continue using the VEMR system in the future? Elaborate	
13. Do you expect using the VEMR system in the future	
E. Employees' actual behaviour towards the adoption of the VEMR System	
14. Are you satisfied with the usage of the VEMR system in work? Elaborate	
15. Would you recommend the use of VEMR system to other healthcare facilities? Elaborate	
16. Do you have positive things to say about the adoption of the VEMR system at your workplace? Elaborate.	
17. Do you have negative things to say about the adoption of the VEMR system at your workplace? Elaborate.	

Observation

Does the employee use the VEMR system?	
Does the employee use the VEMR system at full capacity?	
Does the employee using the VEMR system to enhance patient care?	
Does the employee using the VEMR system to enhance their professional satisfaction?	
Does the employee using the VEMR system and consider it as a resource across the facilities?	

Annexure 3: UKZN Ethical Clearance Certificate

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

26 February 2018

Mr Bahindwa Kalalizi 210552099
School of Management, IT and Governance
Westville Campus

Dear Mr Kalalizi

Protocol reference number: HSS/0089/018M
Project title: Exploring the adoption of the VEMR system at Ithembalabantu Clinic in Umlazi, Durban

Full Approval – Expedited Application

In response to your application received 26 January 2018, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL.**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....
Professor Shenuka Singh (Chair)
Humanities & Social Sciences Research Ethics Committee

/pm

cc Supervisor: Dr Prabhakar Rontala Subramaniam
cc Academic Leader Research: Professor Brian McArthur
cc. School Administrator: Ms Angela Pearce & Ms Hazvinei Manyara Muteswa

Humanities & Social Sciences Research Ethics Committee
Professor Shenuka Singh (Chair)
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Telephone: +27 (0) 31 260 3587/8350/4557 **Facsimile:** +27 (0) 31 260 4609 **Email:** ximbap@ukzn.ac.za / snymanm@ukzn.ac.za / mohunp@ukzn.ac.za
Website: www.ukzn.ac.za

Annexure 4: Amended Ethical Clearance Letter

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

25 August 2020

Mr Bahindwa Kalalizi 210552099
School of Management, IT and Governance
Westville Campus

Dear Mr Kalalizi

Protocol reference number: HSS/0089/018M
New Project title: Attitude of healthcare workers towards the use of the Virtual Electronic Medical Record System at Ithembalabantu clinic, Durban

Approval Notification – Amendment Application

This letter serves to notify you that your application and request for an amendment received on 23 August 2020 has now been approved as follows:

- Change in title

Any alterations to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form; Title of the Project, Location of the Study must be reviewed and approved through an amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

All research conducted during the COVID-19 period must adhere to the national and UKZN guidelines.

Best wishes for the successful completion of your research protocol.

Yours faithfully

.....
Professor Dipane Hlalele (Chair)

/dd

cc Supervisor: Dr Prabhakar Rontala Subramaniam
cc Academic Leader Research: Professor Brian McArthur
cc. School Administrator: Ms Angela Pearce & Ms Hazvinei Manyara Muteswa